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Title: Integrated Safety Management

Los Alamos National Laboratory

Integrated Safety Management

Approved: 

G. Peter Nanos, Director
Los Alamos National Laboratory
February 2003

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Table of Contents

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Figures

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Acronyms and Terms

AA—Audits and Assessments Office
AA-2—Internal Assessments Group
AD—Associate Director
BUS—Business Operations Division
CCB—Change Control Board
CFR—Code of Federal Regulations
D&D—decontamination and decommissioning
DCSC—Director's Central Safety Committee
DL—division leader
DNFSB—Defense Nuclear Facilities Safety Board
DOE—Department of Energy
DOE/NV—Department of Energy Nevada Operations Office
DOT—Department of Transportation
EDS—Employee Development System
EM&R—Emergency Management and Response Group
EOC—Emergency Operation Center
EPA—Environmental Protection Agency
ES&H (environment, safety, and health)—used throughout this document to refer to all activities that are included in the term safety: environment, safety, health, waste minimization, and pollution prevention.
FMWC—facility management work control
FWO—Facilities & Waste Operations Division
FM (facility manager)—an individual appointed by an owing division leader to manage an FMU.
FMU (facility management unit)—the Laboratory is subdivided into facility management units, based primarily on locale, to provide more effective safety management and support services.
FSAR (final safety analysis report)—required for DOE nuclear facilities.
FSP—facility safety plan
G&A (general and administrative)—the principal overhead, indirect cost account funding of Laboratory support activities.
GET—General Employee Training
HAR—hazard analysis report
HCP—hazard control plan
HEERA—Higher Education Employer/Employee Relations Act
HR-6—Training and Development Group
HSR—Health, Safety, and Radiation Protection Division
ISM (integrated safety management)—the principal safety and environmental management system for LANL and DOE.
ISSM —Integrated Safeguards and Security Management
Laboratory—Los Alamos National Laboratory
LANL (Los Alamos National Laboratory)—a DOE laboratory managed and operated by the University of California.

LIG (Laboratory Implementation Guidance)—provides discretionary guidance and/or good business approaches relating to ES&H practices.
LIM—Laboratory Information Meeting
LIR (Laboratory Implementation Requirement)—provides detailed mandatory implementing requirements for the safe performance of work.
LLNL—Lawrence Livermore National Laboratory
Los Alamos—Los Alamos National Laboratory
LPR (Laboratory Performance Requirement)—establishes institutional performance expectations that directly reference the Appendix-G standards as mandatory Laboratory standards; provides the general requirements and expectations that are augmented by performance criteria which, when implemented, ensure that contractual performance requirements are met.
M&O (management and operations)—the type of contract under which the University of California operates LANL for DOE.
N&S—necessary and sufficient
NESS—Nuclear Explosive Safety Study
NMED—New Mexico Environmental Department
NNSA—National Nuclear Security Administration
NNSA/NV—Nevada Office of the Department of Energy
NTS—Nevada Test Site
OIC (Office of Institutional Coordination)—offices assigned to coordinate Lab wide response to external requirements.
OJT—on-the-job training
ORR—Operational Readiness Review
OSHA—Occupational Safety and Health Act
P&T—packaging and transportation
PM—Project Management Division
POC (point of contact)—an individual appointed by a division leader or office leader to act on their behalf to disseminate new requirements, coordinate responses, and self-report for the organization.
PS—Performance Surety Division
PS-7—Occurrence Investigation Group
PS-OI—Operational Integration Office
PT—Project Team
QA—quality assurance
REOP—real estate/operating permit
R&R—roles and responsibilities
RRES—Risk Reduction and Environmental Stewardship Division
RTBF—Readiness in Technical Base and Facilities
S—Security and Safeguards Division
S&T—science and technology
SAD (safety analysis document)—a document required by DOE for certain classes of facilities.
SAR—safety analysis report
SBRT—Safety Basis Review Team
SET—Senior Executive Team

SFM—safety function manager
SME—subject matter expert
SR (surveillance requirement)—monitoring activities required in nuclear and high-hazard facilities.
SWP—safe work practices
TIM—training implementation matrices
TSR (technical safety requirement)—operating conditions required in nuclear and high-hazard facilities.
TRU—transuranic (waste)
UC (University of California)—the institution that operates LANL for DOE.
USQD (unreviewed safety question determination)—a process that addresses safety issues at specified nuclear facilities.
WBS—work breakdown structure
WFO—work for others
WSS (work smart standards)—the necessary and sufficient set of standards to meet performance expectations and objectives for providing adequate protection to workers, the public, and the environment.
Web (world-wide web)—a computer-based information resource.

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Safety and Security Policy

We will never compromise safety or security for programmatic or operational needs.

We are committed to achieving excellence in environment, safety, health, and security performance.

To meet the moral imperative not to injure people, the environment, or compromise the safety of our nation while accomplishing our mission, and the business imperative to meet the environment, safety, health, and security requirements of the contract between the University of California and the Department of Energy, the employees, contractors, and guests of the Los Alamos National Laboratory will strive to have:

- ZERO injuries and illnesses on the job
- ZERO safeguards and security incidents
- ZERO injuries and illnesses off the job
- ZERO environmental incidents
- ZERO ethics incidents
- ZERO people-mistreatment incidents

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Preface

The nation expects a high level of operational excellence at Los Alamos National Laboratory. In support of that expectation, the Laboratory strives (1) to have an injury-free workplace, (2) to minimize accidental property damage, (3) to minimize waste streams, and (4) to avoid unnecessary adverse effects to the environment. The "Six Zeros," firmly established in the Los Alamos Safety and Security Policy, provide a holistic approach to developing a value-based institutional culture that respects people (zero injuries and work-related illnesses and zero people mistreatment incidents); respects the environment (zero environmental incidents); and establishes a complete commitment to ethical behavior on the part of the entire workforce (zero ethics incidents).

Integrated Safety Management (ISM) provides the Laboratory with a comprehensive, systematic, standards-based performance-driven management system for setting, implementing, and sustaining safety performance and meeting environmental expectations. **The term "integrated" is used to indicate that the safety and environmental management system is a normal and natural element of the performance of work. Safety, protection of the environment, and compliance with environment, safety, and health (ES&H) laws and regulations is how we do business.** ISM is the way that we meet the moral commitment not to injure people or the environment, and the business imperative to meet the safety and environmental requirements of the UC-DOE (University of California-Department of Energy) contract for managing and operating the Laboratory.

ISM is integral to accomplishing our mission. The goal of ISM is to establish "Safety" (used generically to encompass all aspects of environment, safety, and health) as a fundamental value for operating Los Alamos, reflected in the attitudes and behaviors of all. ISM is structured to manage and control work at the institutional, the facility, and the activity levels, and seamless integration of ES&H with the work being done is fundamental. Inseparable from this concept is the important principle that line management is responsible for safety, with clear and unambiguous roles and lines of responsibility, authority, and accountability at all organizational levels, with full participation of the workforce. ISM requires that all work and all workers meet the safety and environmental requirements defined by the Laboratory requirements system, as documented in Laboratory performance requirements (LPRs), Laboratory implementation requirements (LIRs), and any supplemental requirements defined for a specific facility or activity.

The Laboratory Director has made ISM one of his six focus areas and has made continuous improvement of safety and security the number one institutional goal. To meet our ISM objectives and the Director's goals, "Safety" must be rooted in the Laboratory's values, attitudes, and behaviors. To execute our strategy for the year 2002 and beyond, we are (1) improving Nested Safety and Security Committees; (2) enhancing behavior-based safety techniques in the workplace; (3) instituting robust Quality Assurance (QA) processes; (4) enhancing conduct of operations; and (5) simplifying the ES&H requirements to enable and enhance the safe performance of work.

This document satisfies the requirements for a documented safety management system found in the DOE-UC contract,[1] and incorporates information and experience gained during the initial years of ISM implementation at Los Alamos. Changes to this document and the associated ISM Continuous Improvement Plan are subject to the approval of the ISM Change Control Board (CCB), comprising DOE, the Laboratory, and the UC Office of the President.

The Laboratory and the Albuquerque and Los Alamos offices of the Department of Energy are currently undergoing a reorganization. As a result of the reorganization, the CCB Charter will be updated to reflect these changes. In addition, Section 3.8, *Organization-Related Roles, Authorities, and Responsibilities,* also will need to be updated to reflect changes in facility management and authorization basis functions. The changes to the appropriate chapters will be made upon completion of the reorganization.

An assessment of the Laboratory's implementation of ISM was conducted April 16-26, 2001. In a memo from the Albuquerque Operations Office Manager, the Laboratory and the Department of Energy's Los Alamos Area Office were notified that both organizations had completed phase-II implementation of ISM.

[1] The University of California Contract between the United States of America and the Regents of the University of California for management of the Los Alamos National Laboratory, Supplemental Agreement to Contract W-7405-ENG-36, Modification M507, effective January 18, 2001, clause I.074 - DEAR 970.5223-1 (DEC 2000), "Integration of Environment, Safety, and Health Into Work Planning and Execution.

1.0 Introduction to ISM

Integrated Safety Management, or ISM, is the system the Los Alamos National Laboratory (LANL) uses to perform work safely and in an environmentally responsible manner. The term "integrated" is used to indicate that safety and environmental responsibility are treated as normal and natural elements of the planning and performance of work, rather than as superfluous restrictions appended to the work The Laboratory as a whole makes safety, environmental protection, and compliance with ES&H (environment, safety and health) laws and regulations an integral part of the way we do business.

ISM provides the institutional system for setting, implementing, and sustaining safety performance and meeting environmental expectations of the Laboratory. This system supports workers in fulfilling their safety and environmental responsibilities. Through ISM, the Laboratory strives to create an injury-free workplace, to avoid property damage, to minimize waste streams, and to prevent unnecessary adverse impacts to the environment from its operations. ISM enables the Laboratory to reach these goals in a rational and cost-effective way.

ISM is the way the Laboratory meets the moral commitment not to injure people or the environment, and the business imperative to satisfy the safety and environmental requirements of the University of California-Department of Energy (UC-DOE) contract for management and operation of the Laboratory. ISM is the Laboratory's approach to implementing DOE Policy P450.1, the Environment, Safety, and Health policy for the DOE complex. This policy sets as the highest priority for DOE mission-related work, daily excellence in the protection of workers, the public, and the environment.

Through ISM, the Laboratory seeks to create a worker-based safety culture that has the features of what psychologist E. Scott Geller has described as a "total safety culture." In such a culture, people are committed to safety in their daily work and feel responsible for taking action to correct unsafe situations. They see safety as an underlying value, not a priority that can be ignored when other priorities seem more important. They receive positive feedback for working safely from both colleagues and management.[2] The Laboratory strives to embody these cultural norms in its policies, expectations, requirements, systems, and processes.

The Laboratory is implementing a similar management system, Integrated Safeguards and Security Management (ISSM), for the sustained execution of security expectations at the Laboratory. ISM and ISSM are complementary management systems based upon the same principles and core functions. When possible, infrastructures are shared, such as the processes for creating, issuing, and communicating requirements and expectations.

[2] Adapted from *Working Safe: How to Help People Actively Care for Safety,* E. Scott Geller (Chilton Book Company, 1996).

1.1. Using this Document

This first chapter of the ISM Description Document describes the general philosophy, which is addressed more completely by the eight guiding principles and five core functions found in Chapter 2. Reading these two chapters provides the overall ISM rationale and outlines the system.

The remaining chapters of this document deal more specifically with how ISM is implemented at the Laboratory. Chapter 3 explains how ES&H roles and responsibilities are defined throughout the Laboratory by the safety- and environment-responsible line-management chain. It further describes the roles that specific organizations within the Laboratory play in the implementation of ISM, and explains how Laboratory employees at all levels are held accountable for ES&H performance.

Chapter 4 addresses the processes by which official safety documents, such as Laboratory performance requirements (LPRs), Laboratory implementation requirements (LIRs), and facility safety plans (FSPs), are written, reviewed, and implemented at the Laboratory.

Chapters 5 through 7 provide more details on the implementation of ISM at the Laboratory. Chapter 5 describes training requirements; Chapter 6 presents the Laboratory's ES&H self-assessment processes; and Chapter 7 explains how ES&H activities are funded.

1.2. ISM Terminology

Throughout this document, **"*safety*"** is used generically to encompass all aspects of environment, safety, and health, including regulatory requirements, pollution prevention, and waste minimization. **"*Work*"** is defined broadly to include all Laboratory activities undertaken by the workforce, independent of sponsor, program, or location of activities. **"*Worker*"** includes all University of California (UC) employees and all subcontractor personnel employed at the Laboratory, and all visitors. The term **"*Hazards*"** refers to actions or conditions that could cause harm to workers or the public or cause damage to property and the environment. Environmental hazards include the potential for violating environmental laws or regulations. **"*Controls*"** are a prioritized set of mechanisms to prevent or mitigate a hazard from causing harm to workers, the public, property, or the environment. Controls include hazard elimination, hazard segregation through procedural restrictions, hazard containment by physical barriers, and human isolation from hazards by protective equipment.

1.3. Institutional ISM Responsibility

The ISM Program Manager guides and tracks the institutional implementation and sustained execution of ISM and updates the "ISM Description Document." The ISM Steering Committee provides input to the ISM Program Manager for these activities.

Each division at the Laboratory is expected to have a division ISM description document that addresses ISM implementation in their division. The division-level ISM document provides specific expectations and actions to attain ISM implementation in a division. The division ISM description document must be consistent with the Laboratory "ISM Description Document" and must be kept current.

Safety function managers (SFMs) are established for each major functional area relevant to ES&H: management systems, occupational health and safety, radiation protection, fire protection, environmental protection, emergency management, facility management, packaging and transportation, and safeguards and security. The responsibilities for the SFMs, which are defined in the Laboratory requirement system, include monitoring the safety performance of the Laboratory in the assigned functional area and semiannual reporting of this performance to the Laboratory Director.

1.4. Personal ISM Responsibilities

ISM is a worker-based safety system. It is built on the premise that everyone is a worker when it comes to ES&H. Management provides leadership and support. Success in reaching our ES&H goals, however, depends upon the involvement of *all* workers at the Laboratory in identifying and resolving concerns, making decisions, implementing initiatives, and providing feedback at all institutional levels. ISM enables workers to apply their knowledge of the work and their skills to protect themselves, the public, and the environment and to minimize property damage. All Laboratory employees implement required ISM elements and provide input for continual improvement of the system. Comments on this document or the ISM system may be submitted to the ISM Program Office (ISM@lanl.gov).

Line management provides leadership and ensures ES&H performance within the context of the Laboratory's values and mission. Laboratory managers establish and manage ES&H initiatives, determine and communicate expectations, allocate resources, assess performance, and are held accountable for safety performance.

Line managers play a central role in the implementation of ISM because they are in a position to listen to workers and respond to their concerns. At the same time, they have access to information that allows them to analyze ES&H issues from a broader perspective and take action to continually improve work practices and processes. When decisions crosscut multiple organizations or the entire institution, management must provide forums for gathering information, discussion, conflict resolution, and, when appropriate, worker participation in the decision-making process. To effectively fulfill their role, line managers must behave in ways that demonstrate to the workforce their commitment to institutional ES&H goals and to safety as a basic value.

Worker involvement and ownership of ES&H includes a decisive stop-work responsibility and authority that workers use to stop work when they discover that they or their co-workers are exposed to conditions of imminent danger or serious hazards. Managers and

supervisors have a responsibility to support the use of this worker responsibility and authority without any hint of reluctance or retribution.

The Laboratory provides various forums for workers to identify and help resolve ES&H problems and to contribute to the improvement of ISM processes. These include direct communication with managers during walk-arounds, in addition to Nested Safety and Security Committees; plan of the day meetings; performance appraisals; the Safety Concern Program; and electronic venues such as ISM@lanl.gov and future@lanl.gov. Performance to ES&H expectations has been and remains part of the performance appraisal and accountability processes.

1.5. Safe and Environmentally Responsible Behavior

Safe and environmentally responsible behavior is characterized by (1) safety as a value, (2) a system of personal accountability, (3) the application of positive and negative reinforcement, and (4) the alteration of perceptions that influence workforce behaviors. Walk-arounds help to reinforce safe and environmentally responsible behavior. Walk-arounds touch everyone at the Laboratory and provide a flexible and simple strategy to help reinforce safety as a Laboratory value. They are an opportunity to observe both working conditions and activities. Workers (non-supervisory) must be included in these walk-arounds because their knowledge of process and conditions can enhance the self-assessment. Walk-arounds allow opportunities for coaching, peer reinforcement, and worker attention and involvement.

The Laboratory also supports the use of vendor-supplied programs for behavioral safety training. The institution has decided that the choice of vendor be left to the discretion of individual facilities and organizations, depending upon their needs.

1.6. Accountability

All members of the workforce, from the Director on down, are held accountable for meeting the Laboratory's ES&H expectations. Accountability accompanies responsibility, and it belongs to every individual at the Laboratory. Accountability is neutral, an implicit contract with expectations. Accountability dictates that one let those expecting the result know the status and outcome. Consequences then follow, which are either positive or negative.

Favorable performance or actions can result in positive rewards, such as recognition, promotion, monetary awards, kudos, etc. Adverse performance or actions can result in negative consequences, for example, criticism or discipline. When it comes to fulfilling ES&H responsibilities, learning from a situation that resulted in a failure or shortfall leading to an unfulfilled responsibility is essential. Lessons learned are important, whereas, fear of discipline can distort or hamper the flow of information that may prevent future occurrences. All levels of supervision must actively promote a culture of information sharing without fear of retribution.

1.7. Communication

Sustained integration of ISM requires teamwork and mutual understanding between workers and management. This demands effective communication that flows both up and down through the organizational structure. The Laboratory is committed to continually improving two-way communication.

Nested Safety and Security Committees (See Sec. 3.8.6) provide a formal communication process, linking levels from a worker monthly safety meeting to the Senior Executive Team (SET) level. For further ES&H feedback from workers, the Laboratory Director and the ISM Program Office both maintain e-mail addresses that any worker can use to ask questions or provide ideas and suggestions. The Director's Office responds to questions from either e-mail or from the town hall meetings.

To provide a means for two-way communication related to official institutional requirements or important safety information, the Laboratory has established a formal network of requirements points of contact (POCs) from each Laboratory organization. These POCs communicate between offices of institutional coordination (OICs) and their Laboratory organizations. Institutional ES&H requirements, as well as special information needing timely distribution in the form of urgent memorandums, alerts, and notices, are communicated via this channel.

PS-7, the Occurrence Investigation Group, issues regular and periodic lessons-learned communications. These cover both notable occurrences and information on trends. PS-7 also manages the Laboratory's Safety Concern Program and the ES&H Hot Line. The former provides an electronic means for any worker to communicate an ES&H concern. This program is similar to the walk-arounds in that it is supported by an interactive database that allows any manager to identify, communicate, and assign corrective actions to designated workers. (See Sec. 6.3.2)

The daily, on-line Newsbulletin covers a variety of special interest subjects, including ES&H. The Newsbulletin also includes a question and answer section for two-way communication about topics of interest. In addition to the Newsbulletin, Laboratory Information Management (LIM) meetings, organization or facility management or all-hands meetings, all-manager meetings, Appendix-F performance measures feedback, and all-employee memoranda provide other communication pathways.

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2.0 ISM System

The DOE has complex-wide ISM system expectations that include safety management objectives, guiding principles, and safety functions that result in a formal, organized process to plan, perform, assess, and improve the safe conduct of work. The DOE ISM system establishes a hierarchy of components to facilitate the orderly development and implementation of safety management. The system consists of six components: the objective, the guiding principles, core functions, mechanisms, responsibilities, and implementation. This section describes the objective, the guiding principles, the core functions, and the tailoring of expectations to the work and the hazards.

2.1. Department of Energy Integrated Safety Management Objective

DOE policy 450.4 states that "The Department and Contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. This is to be accomplished through effective integration of safety management into all facets of work planning and execution. In other words, the overall management of safety functions and activities becomes an integral part of mission accomplishment."

2.2. ISM Guiding Principles

Guiding principles are the fundamental policies that guide actions from development of safety directives to performance of work. Eight guiding principles define the foundation of the Los Alamos Integrated Safety Management System. They serve as the fundamental basis upon which we have built a system of expectations, processes, and the requirements necessary to implement these processes. The Laboratory adopted the seven DOE principles[3] and added a "First Guiding Principle." This principle reinforces the importance of the Laboratory's line management commitment and worker involvement as a foundation for the other seven guiding principles.

2.2.1. The Los Alamos First Guiding Principle

Management Commitment and Worker Involvement. ISM is an employee-based safety and environmental management system. Managers are visibly committed to the implementation and sustained execution of all elements of the system, and workers exhibit continual involvement in the system by understanding and using ISM elements in their work and participating in continuous improvement of the elements.

2.2.2. UC-DOE Contract-Derived Guiding Principles

1. Line Management Safety and Environmental Responsibility. All UC and subcontractor employees, supervising or performing work, and all visitors are in a safety- and

[3] UC-DOE Contract Clause 6.7-DEAR 970.5204-2, taken from 48CFR 970.5204-2.

environment-responsible line-management chain. Throughout this line-management chain, safety and environmental responsibility are integral to decisions relating to the performance of work, including resource allocation, planning, scheduling, and coordination. This chain extends unbroken from external sponsors, through the Laboratory Director, to the workers (See Sec. 3.2).

2. Clear Roles. The Laboratory has established and maintains clear and unambiguous lines of authority, responsibility, and accountability at all organizational levels. ES&H roles and responsibilities are communicated so that everyone can understand their individual and organizational roles related to safety and the environment.

3. Competency Commensurate with Responsibility. Every member of the workforce possesses the experience, knowledge, skills, and abilities necessary to discharge his or her responsibilities. Supervisors ensure that workers are competent to perform the work safely and in an environmentally responsible manner, including compliance with all applicable ES&H laws and regulations.

4. Balanced Priorities. Management allocates resources to address ES&H, programmatic, and operational considerations. Balanced priorities means that resources are allocated as a part of the work planning process to ensure that work can be performed safely, in an environmentally responsible manner, and in full compliance with applicable laws and regulations.

5. Identified Safety and Environmental Standards and Requirements. Before work is performed, the associated hazards are evaluated, and agreed-upon ES&H standards, requirements, or controls (i.e., expectations) are established, which, when properly implemented, ensure that the workers, the public, and the environment are protected from adverse consequences.

6. Work-Tailored Hazard Controls. Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed. Emphasis is on designing the work or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures.

7. Authorized Operation. Necessary conditions and agreements for operations to be initiated and conducted are clearly established. Most operations are authorized by the DOE under the Prime Management and Operations Contract between UC and the DOE. Some operations are authorized under activity- and facility-specific authorization agreements between the Laboratory and DOE. Work at the activity level is authorized, as are the workers who perform the work, by a formal work management process (See Sec. 4.4.2).

2.3. ISM Core Functions and the Los Alamos Five-Step Process

The Guiding Principles described above provide the architecture for the Los Alamos ISM System. They do not, however, provide the detail for meeting the expectation for the

Laboratory to accomplish its mission cost effectively while striving for an injury-free workplace, minimizing waste streams, and avoiding adverse impacts to the environment from its operations. At Los Alamos, the ISM core functions are referred to as the "five-step process."

ISM uses the five-step process to ensure that expectations are (1) established, (2) implemented, and (3) measured and reinforced in every work activity. Figure 1 shows the integration of the five-step process with "Establish Expectations," "Implementation of Expectations," and "Measurements and Reinforcement of Expectations" in our work activities. The process steps appear discrete, but the expectations overlap.

The Los Alamos five-step process defines a systematic approach to actions taken when we perform work:

(1) Define the scope of work
(2) Analyze the hazards and environmental aspects
(3) Develop and implement the controls
(4) Perform the work
(5) Ensure performance

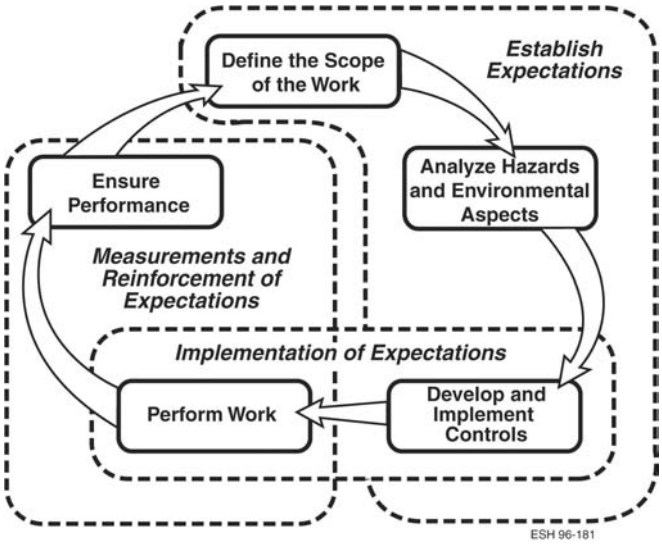

Figure 1. The five-step process for meeting safety performance.

The five-step process applies to all work at Los Alamos, from office activities to designing experiments to assembling and detonating explosives. The effort required for the application of the principles is determined by the nature of the work and the associated safety and health hazards and potential environmental effects. For work with minimal hazards and environmental effects, such as keyboarding, the application of the functions may be a simple mental exercise at the start of each workday, e.g., focusing on the positions of the keyboard, monitor, chair, and body. For assembling and detonating

explosives, the process may require expert safety and environmental analysis, formal documentation, and third-party review, all extending over many months, if necessary.

Figure 2 shows the five-step process in more detail. Each step in the process contains supportive actions typically taken. As shown by the arrows, work begins with some direction to take action. The process is focused on developing a tangible work output. The steps are arranged in a ring to illustrate continuous improvement. Sometimes very complex work scenarios may necessitate that the interrelationships among the different functions iterate or flow in a different sequence from the directions shown in the figure. The five-step process is the foundation of ISM and the safe and environmentally responsible performance of work.

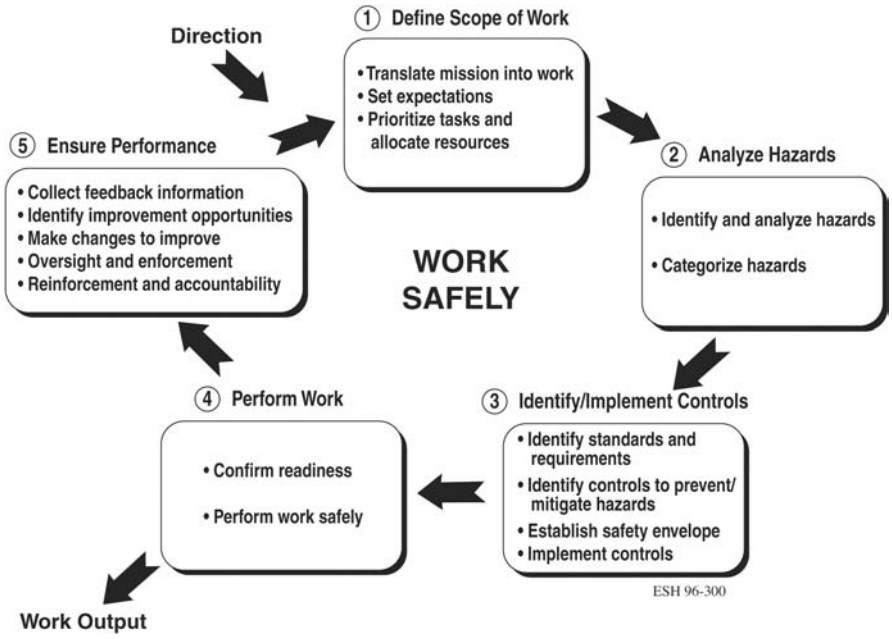

Figure 2. The Los Alamos ISM five-step process.

2.4. Tailored or Uniform Expectations

The Laboratory has expectations for safety that are either tailored to specific facilities or activities or are uniform across the institution. Expectations specific to the *environment* are based on laws, regulations, and institutional perspectives and are typically uniform across the institution.

Tailoring expectations to specific facilities or activities allows flexibility and worker discretion to ensure that expectations are reasonable, practicable, and effective; that the exercise of judgment is at designated decision levels; that there is worker involvement and buy-in; and that there is a balance of competing needs. The degree of rigor and formality

in documentation, the nature of controls, and the extent of performance assurance are commensurate with the work hazards and potential environmental impacts.

Institutional requirements give economy-of-scale and uniformity in meeting expectations, allow the Laboratory-wide application of industry practice, and reduce liability and risk. These benefits are not easily obtained from tailored expectations that may differ from facility to facility.

Laboratory workers implement ISM using the five-step process to create tailored expectations in facility and activity work, while retaining a required level of institutional uniformity: work-specific tailoring at the activity level, tailoring to meet the facility's safety basis at the facility level, and uniform expectations at the institutional level.

The five-step process is applied at the

- **activity** level—discrete work activities performed in the workplace (e.g., a facility maintenance or a research and development activity);
- **facility** level—collected activities within a specific facility; and
- **institutional** level—collective activities of the Laboratory.

Figure 3 illustrates how the five-step process is applied at the activity, facility, and institutional levels.

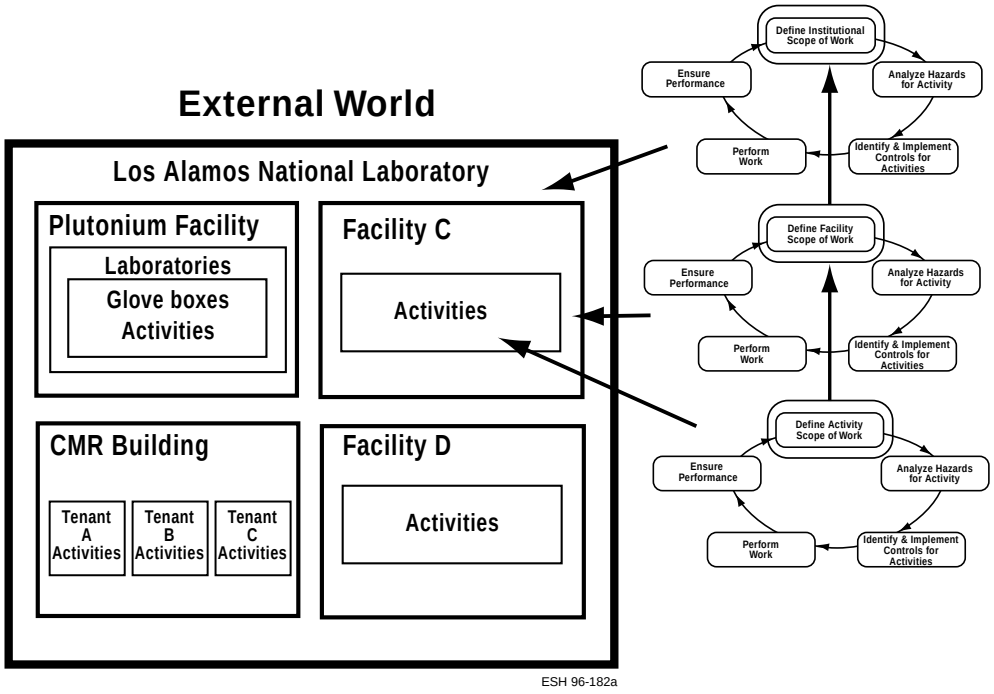

Figure 3. The five-step process at the activity, facility, and institutional levels.

Common expectations related to safety and environmental performance apply to all activities encompassed by the Laboratory boundary as shown in Figure 3. Each facility adds, as necessary, its own set of expectations that apply to work in the facility. These expectations are in addition to those already established by the institution. Activity-specific expectations also may be added by the line organization performing the work. Figure 3 also illustrates the nested relationship of requirements.

It is fundamental to ISM that all work will be performed safely while meeting the applicable institutional-, facility-, and activity-level requirements. The five-step process can also be shown a little differently, as in Figure 4, to illustrate the relationship of the process to the institutional, facility, and activity levels.

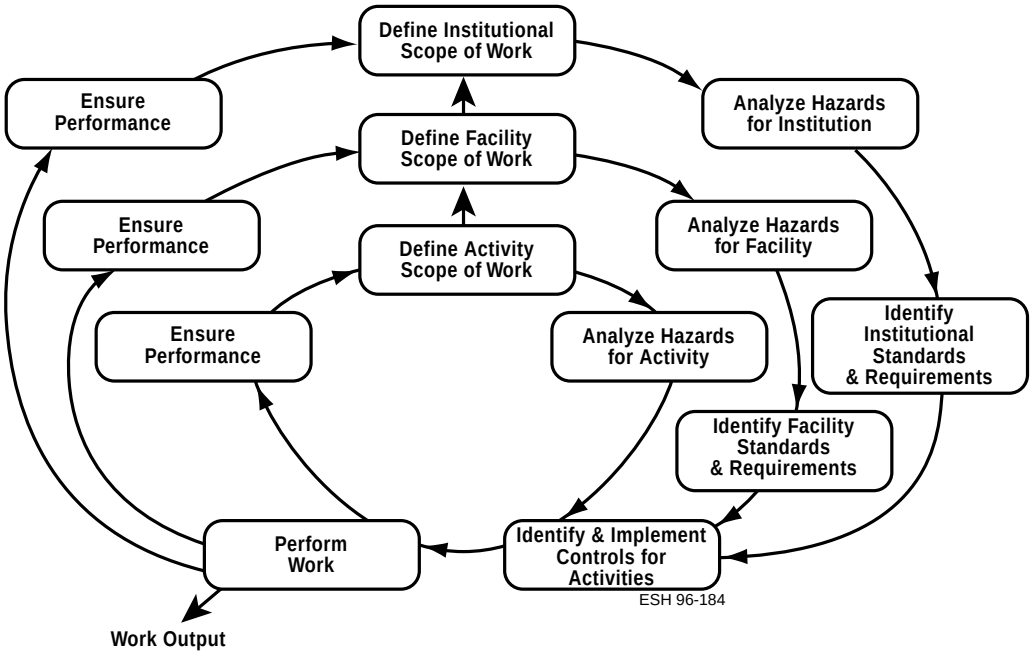

Figure. 4. The five-step process at the institutional, facility, and activity levels.

The outer circle represents the institutional level, with the innermost circle representing the activity level, and the middle circle representing the facility level. Convergence in the five-step process occurs at "Identify & Implement Controls for Activities." The levels diverge at "Perform Work." This figure illustrates that an activity must not only meet expectations derived from its activity-specific work definition and hazard and environmental impact analysis, but must also meet applicable expectations established for the institution and the facility where the activity is conducted. In general, institutional and facility expectations prescribe specific processes or controls at the activity level only when compelling justification exists for facility-wide or Laboratory-wide consistency.

Activities undertaken during emergencies should be done as safely as possible, consistent with the nature of the emergency. Emergency actions may be taken outside of the documented requirements of ISM.

To achieve this integration of the three levels of expectations and controls, the Laboratory has tools that provide the necessary communication between the levels. ISM at the Laboratory is structured to manage and control work at the activity level. *Activities* are performed within a facility management unit (FMU), which consists of the grounds, structures, and services within geographical areas. Programmatic workers operate in FMUs as *tenants* performing computational, experimental, and administrative activities. Work performed on the physical structures, systems, and facility grounds is called *facility work*. As FMUs often serve the needs of many tenants, facility work is controlled in a manner to ensure that an activity does not have unacceptable adverse impacts on tenants.

When the Laboratory needs to use the services of a vendor to perform work (such as maintenance on equipment), a contracting mechanism is used. Part of the contracting mechanism is a process to identify and communicate the hazards that the vendor may be exposed to while performing work in the facility. Included in this process is a means by which the vendor agrees to perform the work safely and meet applicable national codes and standards.

2.5. The Five-Step Process Applied to the Environment

Using the five-step process to consider and mitigate potential environmental impacts requires additional considerations. A modest negative environmental effect by a single activity that does not stress the environment beyond its natural, self-healing capability may not need to be prevented or controlled. Should many activities, however, cause a similar effect, and should the accumulation of all those activities overwhelm the environment's self-healing capability or exceed a regulatory limit, then the activities need to be controlled to prevent or mitigate the negative effects. Thus, for environmental considerations, Step 1, define the scope of the work, must take into account (1) the entire life cycle of the work, including such issues as environmental impacts associated with the production of raw materials used; (2) subsequent processing and disposal of wastes created; and (3) end-of-service decommissioning. Similarly, hazard analysis must consider institutional requirements (e.g., discharge limits for facilities and waste minimization goals for the Laboratory) when specifying controls. Cost-effective controls or mitigators for environmental concerns should be found and applied in these instances just as for worker protection. Eliminating the environmental hazard through process modification or material substitution is preferable to controlling the hazard through waste and pollution management.

Under DOE's guidance for implementing Executive Order 13148, "Greening the Government through Leadership in Environmental Management," the Laboratory is upgrading the environmental component of the ISM system to better satisfy the requirements of an environmental management system. Using ISO 14001 as an environmental management system standard, the Laboratory has performed a gap analysis

comparing the present environmental component of ISM with ISO 14001 requirements and is working to strengthen the system.

Designing and continuously improving all activities so they are inherently compliant and protective of the environment is the best approach to environmentally responsible management. The Laboratory identifies the most serious institutional environmental risks, and controls are established for facilities and activities that increase those risks. In all cases, a graded approach is taken; i.e., an activity that increases a specific risk by a trivial amount is not controlled with the same rigor as an activity that significantly increases that risk.

3.0 Roles, Responsibilities, and Accountability

Working safely and in an environmentally responsible manner is every worker's responsibility and is a condition for employment at the Laboratory. For any worker at the Laboratory, these ES&H roles and responsibilities (R&R) are determined both by the individual's job position in a safety- and environment-responsible line-management chain and the role of the organization to which they belong. Clear and unambiguous roles and lines of responsibility, authority, and accountability at all organizational levels of the Laboratory are necessary to meet the expectations of an integrated management system.

3.1. Individual Responsibilities

Each person at the Laboratory is part of a safety- and environment-responsible line-management chain tasked with creating an injury-free workplace and minimizing adverse environmental impacts. Unless this responsibility is formally transferred, all UC employees, subcontractors, and official visitors are part of the safety- and environment-responsible chain of the organization to which they belong (see Sec. 3.2). Collectively, the safety- and environment-responsible line-management chain, from the employee through the Laboratory Director, is responsible for the ES&H of the work done by the organization, although workers at different levels have different responsibilities and authorities. Except by a formal written agreement, a member of one organization *cannot* be part of another organization's safety- and environment-responsible line-management chain. At any time, an individual can be a member of only *one* safety-responsible chain.

Each person in the chain is a worker who at times may also perform supervisory or management functions. The responsibilities and authorities for each worker are determined by the function he or she is performing in their job assignment. Each worker has the responsibility and authority for the following:

- perform all work safely, contribute to the safety of those around them, and minimize adverse environmental effects;
- ensure that all work is authorized and performed in accordance with the five core functions of ISM, as required by the safe work practices (SWP) and the facility management work control (FMWC) LIRs (LIR 300-00-01 and LIR 230-03-01, respectively);
- ensure applicable ES&H requirements are met (including compliance with all ES&H laws and regulations);
- report incidents (including near misses), accidents, and occurrences to line management;
- use lessons learned from any control failures, near misses, or accidents to make system improvements; and
- stop work that is perceived to be unsafe or environmentally irresponsible.

3.2. Supervisors and Managers

The Laboratory has established management and supervisory positions that formalize the direction of work, and these are used to define the safety- and environment-responsible line-management chain for UC employees.[4] The UC safety- and environment-responsible line-management chain can start with any employee and flows upward through the Laboratory Director (see Figure 5). Starting with the group-leader level and flowing upward through the Laboratory Director, the chain is defined by the succession of direct reports that establish job assignments, appraise performance, and determine salaries. Below the group-leader level, the safety- and environment-responsible chain includes "workers on the floor" and may include non-management supervisors (such as team leaders, principal investigators, or technician supervisors) who direct the day-to-day activities of employees under their supervision.

Supervisors are personnel who direct the work of others. Supervisors may or may not also be "managers." Supervisors have the authority and are expected to hold their employees accountable for ES&H. In addition to their ES&H roles as members of the workforce, supervisors at all levels have the responsibility and authority to perform the following:

- actively and visibly demonstrate their personal commitment to ES&H by providing sustained leadership, including promoting, modeling, and ensuring safe and environmentally responsible behaviors and compliance with all applicable ES&H laws and regulations;
- involve workers in all aspects of working safely and provide essential resources, including training, systems, and tools, for performing work safely and in an environmentally responsible manner;
- authorize work and workers consistent with SWP and FMWC;
- review the work of supervised personnel for the effectiveness and utilization of hazard controls to identify opportunities for improvement;
- resolve disputes and conflicts regarding ES&H; and
- identify and provide the resources necessary to perform the work safely.

The overall responsibility for ensuring that the appropriate ES&H values, systems, processes, and resources are present increases with the level of management up the safety-responsible chain.

Line managers must communicate to funding providers, the resources necessary to safely do their organization's work. Non-management supervisors communicate through their line supervisors, unless otherwise delegated.

[4] Similar chains exist in the Laboratory's subcontractor organizations, but the particular management titles may differ.

Figure 5 shows the safety- and environment-responsible line-management chain for UC employees. This chain starts with any employee and flows upward through the Laboratory Director.

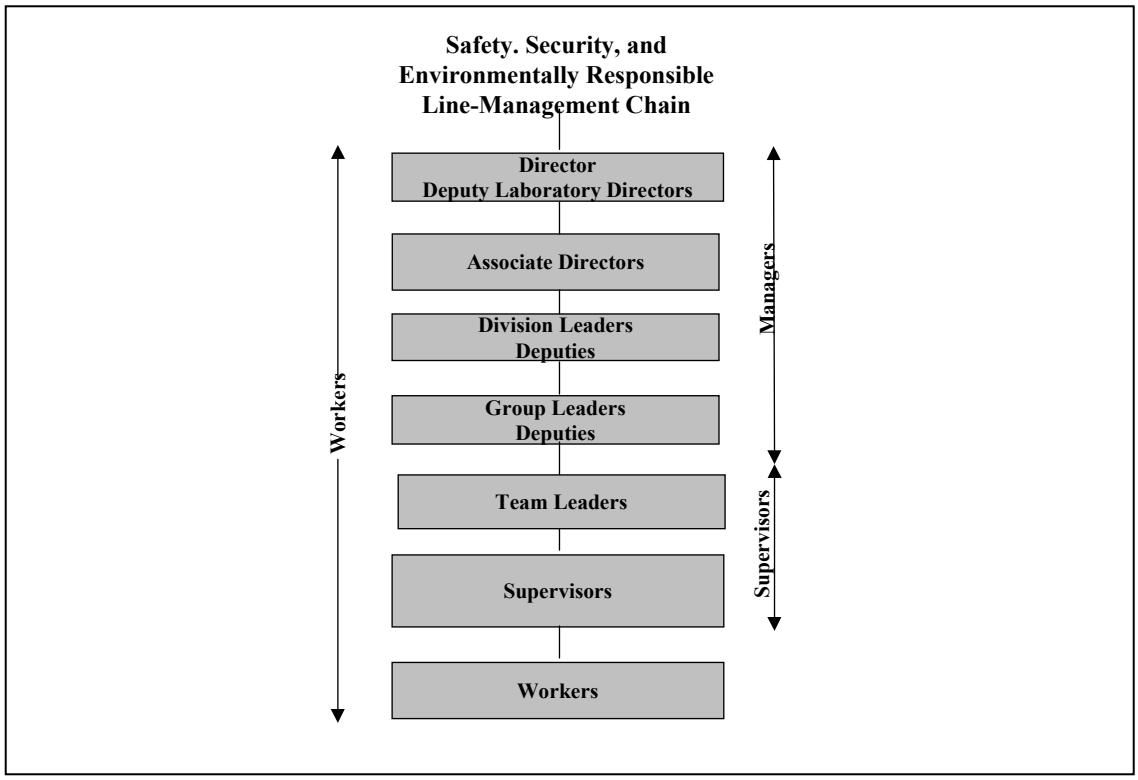

Figure 5. Safety- and environment-responsible line-management chain.

3.3. Deployed Workers

The staff of a Laboratory organization is often augmented by the addition of workers from another organization. This might be the result of deploying workers to support a particular project, organization, or facility. In these instances, the deployed person may not have any contact with his or her organizational safety- and environment-responsible line manager for extended periods of time, and the line manager may not have an adequate understanding or control of the hazards in the deployed person's work environment. In such cases, the line management ES&H responsibility may be transferred to an accepting organization with the following conditions:

- The transfer of ES&H responsibility must be documented and agreed to by the home and accepting organizations.
- The home organization retains salary and performance responsibility.

- The accepting organization assumes an ES&H responsibility equivalent to that of its regular employees.

3.4. Subcontractors

Laboratory subcontractors are subcontract workers hired through either personal service contracts or independent task-oriented subcontracts.

Personal service subcontractors use Laboratory facilities and equipment and are directly supervised by UC personnel. These subcontractors become part of the line-management chain of the contract-holding organization. If the subcontractor's work is directed under a different chain than the contract-holding organization, then responsibility for safety must be formally transferred to that chain. In this relationship, the UC chain is responsible for safety, but performance, disciplinary, and other personnel actions remain the responsibility of the contract labor subcontractor organization.

Independent task-oriented subcontractors have specific statements of work identifying discrete tasks and deliverables. These subcontractors work independently of the Laboratory to deliver the specified technical product. There is no direct UC supervision of the work or workers notwithstanding technical direction. Task-oriented subcontractors (including support services and protective force subcontractors, service/maintenance, and construction subcontractors) are part of a safety- and environment-responsible line-management chain within their companies. UC employees who request the services of a subcontractor have a supporting safety and environmental responsibility (1) for coordinating the Laboratory interface, (2) for providing a safe work environment for subcontractor personnel, and (3) for communicating ES&H expectations to the subcontractor. Subcontractors must meet safety expectations identical or equivalent to those of the Laboratory. When these conditions are met and the contracts are established, safety responsibility for an activity may be transferred to the subcontractor. If the subcontractor is involved in an activity that may have an environmental impact, special precautions must be taken to mitigate that impact. In addition, subcontractors are also responsible for complying with all applicable ES&H laws and regulations while performing work on Laboratory property.

3.5. Student Safety Mentoring Expectations

The student population presents unique opportunities and challenges. The Laboratory's expectations for student safety are the same as for all other employees, and our goal remains zero work-related injuries and illnesses. Students are often less experienced in their fields and may not have completed their formal education. In addition, their employment at the Laboratory is often compressed into concentrated periods of time during the summer or during school breaks. At the same time, our student population represents our future workforce, and their student work experience at the Laboratory provides an outstanding opportunity to begin the process of developing an understanding of the Laboratory's ISM culture and expectations.

To ensure proper safety management of our student population, the safety- and environment-responsible line-management chain for each student must be made clear to the student and their supervisor(s) and mentor(s). In addition, each division must ensure each student is assigned a mentor who is supported by a strong and effective mentoring program. This mentoring program must ensure the selection of high-quality mentors; adequate preparation before a student's arrival; proper training, supervision, and student involvement in safety issues during the student's work tenure; and an effective feedback process both during and upon completion of a student's employment. This program must be supported in each division's ISM description document.

3.6. Official Visitors

Official visitors (including guests, consultants, and other people that visit or perform work at the Laboratory) have the same ES&H responsibility as UC employees. The Laboratory host organization is the safety- and environment-responsible line-management chain.

3.7. Work Off-Site

ISM applies to Laboratory employees working at Laboratory-leased facilities. Laboratory employees working at other sites (non-Los Alamos) typically work within the host site's ISM system and are integrated into the host organization's safety- and environment-responsible line-management chain. If the ES&H practices of the host site are deemed inadequate by the employee or their line manager, or it is not possible for the employee to be integrated into the host line-management chain, the ES&H responsibility remains with the Laboratory safety- and environment-responsible line-management chain. The Nevada Test Site (NTS), however, presents a unique situation in which the Laboratory and other major tenant organizations are required to work within their own ISM systems.

Work at the Nevada Test Site
Los Alamos National Laboratory maintains a permanent party workforce at NTS to maintain facilities, systems, and processes necessary to support critical mission objectives. This workforce can increase significantly in size during experimental activities. The Laboratory must implement and maintain an ISM system for its personnel and activities at the NTS.

The NTS is operated by the NNSA/NV. Through a management agreement with the NNSA's Albuquerque Operations Office, NNSA/NV stipulates the work requirements for NNSA (National Nuclear Security Administration) contractors at the NTS. These requirements are included in a work smart standards (WSS) set that is specific to NTS activities and the organizations conducting these activities. The NTS WSS set augments, but does not replace, other contractual requirements listed in Appendix G of the UC-DOE contract.

Responsibility for facilities and operations at the NTS is delegated by NNSA/NV through real estate/operating permits (REOPs). There are two types of REOPs: Primary REOPs delegate overall responsibility and authority for the operation of a facility, including the

implementation and maintenance of ISM for that facility and the activities conducted within its boundaries. Secondary REOPs define the operating envelop, interfaces, and R&R of organizations and their personnel working in facilities for which the primary REOP is held by another organization. A secondary REOP augments the primary REOP for a specific period of time, and requires coordination with the holder of the primary REOP to ensure that the safety envelope of the primary REOP is not violated by the activities of the secondary REOP.

The primary REOP holder maintains safety coordination responsibility for the designated real estate and/or operations identified in the REOP. The Laboratory is responsible for implementing and maintaining ISM at those facilities for which it holds the primary REOP.

Consistent with the ISM guiding principle pertaining to clear R&R, the Associate Director for Operations delegates the responsibility for the implementation and maintenance of ISM at the NTS to a division leader of an organization with permanent party personnel at the site. Implicit in that delegation is the authority to implement systems and programs necessary to achieve and maintain full implementation of ISM. The responsible division defines ISM implementation at the NTS in more detail in its organization's ISM description document.

The responsible division has the primary responsibility and commensurate authority for developing, implementing, and maintaining programs and processes necessary to assure the satisfactory implementation of ISM by all Los Alamos organizations and employees working at or visiting the NTS. In addition to those defined in the Laboratory's ISM system, expectations for NTS operations must be defined in the responsible division's ISM description document. The division is further responsible (1) for identifying those LPRs and LIRs that apply to NTS operations, and (2) for developing needed supplemental requirements that apply to all LANL organizations and employees working at the NTS. Consistent with the guiding principles of ISM, the responsible division is expected to engage other Laboratory organizations and their employees in fulfilling these responsibilities.

Along with the LANL requirements that employees must implement for activities at the NTS, there are specific Nevada laws, codes, and DOE orders that delineate both program and safety requirements which must be met. The Nevada Office of the Department of Energy (NNSA/NV) has documented its systems and mechanisms for integrating safety management through a set of documents, including (but not limited to) the following:

- NV M 111X, Functions, Responsibilities, and Authorities Manual
- NV M 450.3XA, Work Smart Standards Manual
- NV M 412X1B, Real Estate/Operations Permit
- NV M 450.XA, Authorizations and Activity Agreements for Facilities and Operations
- NV M 220.XB, NNSA/NV Oversight Management Systems
- NV O 230.XA, DOE/NV Lessons Learned Program

3.8. Organization-Related Roles, Authorities, and Responsibilities

In addition to the ES&H responsibilities determined by an individual's role in the safety- and environment-responsible line-management chain, ES&H responsibilities are also based upon the roles of the organization to which the worker belongs. The organization's roles can be categorized as operating, program, facility, or service. While most Laboratory organizations serve predominantly a single role, in many cases, they serve multiple roles. For example, the same organization can have both program and operating roles or both service and operating roles. Regardless of their role, all Laboratory organizations perform work and have safety- and environment-responsible line-management chains. Figure 6 shows a simplified schematic of the Laboratory's organizational structure.

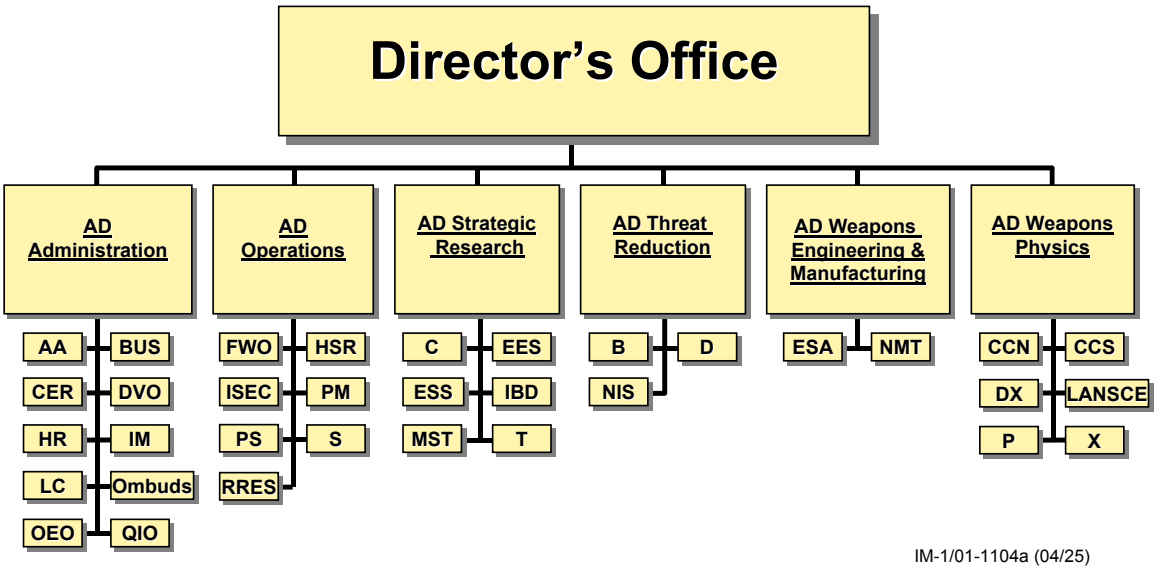

Figure 6. Laboratory organizational structure.

3.8.1. Director's Office

The Director's Office has line management R&R in all four organizational functions: operating, program, facility, and service. This office includes the Laboratory Director, Principal Deputy Director (Chief Operating Officer), and two Deputy Directors. There are six Associate Directors that report to the Laboratory Director and to whom the Laboratory divisions report. As the top-most level of the line-management chain, these managers have ultimate responsibility and authority for protecting workers, the public, and the environment, including establishing, communicating, and reinforcing the Laboratory's ES&H values and vision.

3.8.2. Science and Technology Divisions

Science and technology (S&T) divisions perform the programmatic, or mission-related, work of the Laboratory. Individual ES&H roles and responsibilities have already been discussed (see Sec.3.1).

3.8.3. Facility Management

The Laboratory uses distributed facility management to provide and maintain facilities that support the performance of work in a manner that protects the workers, the public, and the environment. Facilities are "owned" by a division leader (DL) and managed by a facility manager (FM). More than one division may occupy a single facility, and divisions may "own" several facilities. Facility management groups or teams are responsible for providing safe facilities for work. This includes (1) establishing the facility's operating limits (safety and environmental envelope) that bound the work which can be done safely and in an environmentally responsible manner; and (2) providing essential facility infrastructures (including facility-related structures, systems, and management processes) that support safe work. In addition to their safety- and environment-responsible roles, workers in facility management organizations have responsibility for the following:

- operating the facilities safely and providing responsive and reliable facilities and services to support tenants' operational responsibilities;
- establishing and maintaining FSPs[5] (i.e., the authorization basis) to define the facility operating limits (safety and environmental envelope);
- establishing facility-level requirements to ensure that the facility's operating limits and compliance with all ES&H laws and regulations are maintained;
- establishing authorization agreements with the DOE, based upon FSPs;
- communicating facility operating limits and requirements to facility tenants and their cognizant line management through Facility-Tenant Agreements;
- periodically reviewing and permitting tenant work in the facility;
- safely managing all facility-related work, such as maintenance, repair, modification, or construction within the facility; and
- communicating resource requirements to facility funding providers.

The relationship between the facility and line organizations is shown in Figure 7, which illustrates that both lines A and B must meet the institutional and facility requirements. Activity requirements apply to work being performed by line B. The Facility-Tenant Agreement and the FSP define the interface between the line-A facility management organization and the line-B tenant organization. The FM permits work, and the activity line manager directs work.

Note: This means that the FM can say yes—the work may be performed; or, no—the work may not be performed; or can stop work that presents an immediate hazard or breach of the facility safety and environmental envelope.

[5] See Sec.4.4.3.3 for a detailed description of FSPs.

Tenants of a facility must work within the facility safety and environmental envelope. The tenants' line management must also (1) inform and seek the approval of the FM for activities planned in the facility that are not already clearly permitted by the Facility-Tenant Agreement or the FSP, and (2) work with the FM to ensure that the integrity of the facility's operating limits is maintained.

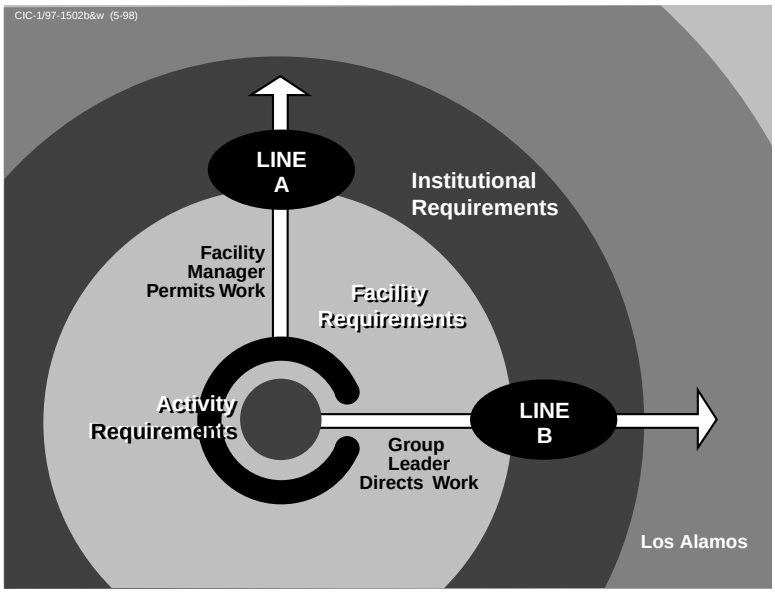

Figure 7. Interface between facility and line management: permitting and directing work.

3.8.4. Program Functions

Program functions may reside in any organization within the Laboratory. Unless they are acting in the capacity of a line manager for their organization (e.g., when supervising office staff), program function managers have limited accountability for safety or environmental performance. In addition to their roles in the safety- and environment-responsible line-management chain, individuals working as program function managers must

- establish expectations and requirements to ensure that Laboratory standards for ES&H are a part of program plans, funding, and project definitions;
- ensure that ES&H is an integral and discernible part of the work planning and execution process;
- ensure that resources, plans, schedules, and facilities are sufficient for work to be performed in a manner that protects the workers, public, and the environment and meets all applicable ES&H laws and regulations; and

- communicate and support ES&H schedule and budget requirements to line managers and customers.

Pantex Site Support

The first formal enunciation of design agency responsibilities for safety analysis at Pantex was provided in a memo (dated September 4, 1998) from Bruce Twining (DOE) to Steve Younger (LANL). Since that time, the requirements have been slightly modified and currently reside in the Development and Production (D&P) Manual, Chapter 11, "Management of Nuclear Explosive Operations at the Pantex Plant." The requirements in that chapter are basically as follows:

- "provide a Project Team member for each weapon system and provide technical expertise as required for weapons projects or facility authorization basis upgrade projects, within negotiated resources and priorities;" . . . "the Design Agencies are also responsible for the preparation and control of the Weapon Safety Specification (WSS)." (Chap. 11.3, Sect. 4.9)
- "provide weapon and hazardous component response information to the Pantex Plant management and operating (M&O) contractor for identified accident scenarios;" . . . "verify the Pantex Plant M&O contractor Documented Safety Analysis documents appropriately used the weapons response information;" "issue information engineering releases (IERs) that document the release of weapon response information and its appropriate use by the Pantex Plant M&O contractor;" and "participate on and support Safety Basis Review Teams [which review the Authorization Basis]." (Chap. 11.4, Sect. 4.3)
- "support NESS [Nuclear Explosive Safety Study] reviews," and "provide documentation to support proposed changes or input documents." (Chap. 11.7, Sect. 5.3)
- "establish the weapon insult parameters to be used in hazard event identification," "develop a WSS screening table for each weapon and include this table in the Weapon Safety Specification;" "develop a process for establishing and documenting the justification for weapon response that meets the needs of the Pantex Plant Operating Contractor;" and "provide input to residual risk justification when a discussion on weapon safety features is needed." (Chap. 11.8, Sect. 5.2) [**Note**: More detailed requirements for weapons response are in Appendix A of the Development & Production (D&P) Manual.]

In addition to the above formal requirements, it should be noted that the Design Agency normally participates on the Hazard Analysis Task Team, a project team (PT) sub-team that prepares the Hazard Analysis Report (HAR). The Design Agency is also sometimes requested to participate in Operational Readiness Reviews (ORRs).

Facility upgrades are the responsibility of the Pantex Plant M&O Contractor. Los Alamos, as a member of the PT, assists by carrying out assignments from the PT Leader. Such assignments normally include weapon response to hazardous environments identified by the PT and may also include tasks related to development of the HAR. For these studies, Los Alamos will verify the accuracy and appropriate use of these inputs.

Los Alamos also serves as a technical advisor to the Safety Basis Review Team (SBRT), a DOE-led team that reviews the authorization basis documentation for the facility upgrade and issues the final Safety Evaluation Report. Finally, Los Alamos participates on the DOE-led Nuclear Explosive Safety Study (NESS) Group that reviews not just the authorization basis documentation but also the actual operations for nuclear safety.

Verification of weapons response information is carried out by independent review; i.e., hazard analysis or other analytical inputs are reviewed by experts not directly involved in developing the inputs. Los Alamos provides independent reviewers for new weapon response information or compares inputs to those previously developed and reviewed by independent in-house experts or by Lawrence Livermore National Laboratory (LLNL). By carrying out these reviews, Los Alamos provides institutional agreement that the inputs reflect the current state of knowledge and are correctly interpreted. LANL makes no statements regarding the adequacy of the overall study.

A key area of responsibility for the Laboratory is associated with the assessment of an operation for the disassembly, inspection, and reassembly of a weapon of Los Alamos design. In this case the Pantex Plant M&O contractor still has responsibility for the safety basis, but Los Alamos plays a more central role in reviewing tooling and procedures associated with the actual weapon to assure the design intent is achieved. The remainder of the process is analogous to that for facility upgrades, except that Los Alamos' participation in developing the HAR is more direct because the actual weapon may be partially exposed in various scenarios. The other responsibilities include the verified Weapon Safety Specification, verified weapon response, and SBRT and NESS participation.

The final area of LANL's responsibility involves operations on weapons designed by LLNL and upgrades of equipment to be used in conjunction with nuclear weapons. In this area, Los Alamos responds to requests from DOE to provide technical expertise and/or participate on reviews such as NESS or ORRs.

3.8.5. Institutional Service Organizations

Institutional service organizations provide support and services for the S&T, programmatic, and facility organizations. They are responsible and accountable for providing expertise, assistance, services, and institutional processes. They also coordinate and support institution-wide needs. In addition to their line safety- and environment-responsible chain roles, individuals working in support and service

- provide vision, leadership, direction, communication, and facilitation to promote continuous improvement and ES&H excellence;
- serve as the central point of contact, coordination, and support for interactions with regulators, stakeholders, and the public, involving other Laboratory organizations in these interactions when required;
- manage processes that ensure institutional expectations in the form of ES&H standards, policies, and requirements;

- provide performance feedback and elevate issues through the safety- and environment-responsible line management chain; and
- communicate resource requirements to providers of funding.

3.8.5.1. Health, Safety, and Radiation Protection (HSR) Division

HSR Division is primarily a service organization that provides a broad range of technical expertise and assistance in areas that include worker health and safety, facility safety, and nuclear safety. The division has responsibility and authority to

- provide staff and subject matter expertise to lead, promote, and facilitate implementation and sustained execution of ISM;
- promote health and safety excellence and provide health and safety leadership throughout the Laboratory;
- perform Occupational Safety and Health Act (OSHA) self-assessment-type workplace safety inspections for the Laboratory and prioritize hazards for abatement;
- coordinate, maintain, and provide implementation assistance for institutional requirements relating to health and safety;
- serve as the central point of institutional contact, coordination, and support for interfaces with health and safety regulators, stakeholders, the public, and the DOE;
- provide health and safety performance feedback, elevating issues, and making recommendations to Laboratory organizations; and
- provide health and safety support and services, including technology improvement, compliance guidance, and development of measures, objectives, and targets that continuously reduce the risk of worker injury.

3.8.5.2. The Integrated Safety Management Program Office

The ISM Program Office in HSR Division is responsible for overall institutional coordination and tracking of the Laboratory's Integrated Safety Management System. This office

- provides leadership and coordinates the implementation of ISM;
- tracks and evaluates the status of the deliverables for the Laboratory's ISM Continuous Improvement Plan; and
- helps address ISM issues and elevates them, as necessary, to management.

The ISM Steering Team authors this document and provides guidance for the Laboratory's ISM Program.

3.8.5.3. Risk Reduction and Environmental Stewardship (RRES) Division

RRES is primarily a service organization that provides a broad range of technical expertise and assistance in environmental protection. The division has responsibility and authority to perform the following:

- provide environmental support and services, including technology improvement, compliance guidance, and development of measures, objectives, and targets that continuously reduce the risk of environmental non-compliance;
- plan, direct, procure funding, and manage the Laboratory's environmental restoration activities;
- serve as the central point of institutional contact, coordination, and support for interfaces with environmental regulators, stakeholders, and the public, including DOE, the New Mexico Environmental Department (NMED), and the Environmental Protection Agency (EPA);
- provide leadership and services relating to pollution prevention and environmental stewardship, including developing measures, objectives, and targets for pollution and waste reduction;
- provide technical and scientific support to line organizations and Laboratory management on waste management, D&D (decontamination and decommissioning), and pollution prevention and waste minimization; and
- coordinate, maintain, and provide implementing assistance for institutional requirements (LPRs and LIRs) relating to waste management and environmental stewardship.

3.8.5.4. Facilities & Waste Operations (FWO) Division

Primarily a service organization, FWO ensures that current and future facilities and infrastructures are planned, built, operated, maintained, and provided with necessary support and services. This includes facilities engineering, maintenance and operations services, fire protection services, utilities, coordination of facility management, and facilities planning. The division

- promotes excellence in facilities and facility operations throughout the Laboratory.
- coordinates, maintains, and provides implementing assistance for institutional requirements (LPRs and LIRs) relating to facilities.
- coordinates the FMUs by providing the following:
  - facility support and services throughout the Laboratory, including developing measures, objectives, and targets for energy, water, and natural resource conservation;
  - management of all institutional waste management operations, including the sanitary waste-water system, the Radioactive Liquid Waste Treatment Facility, the low-level radioactive waste disposal facility, and the long-term storage facilities for hazardous, mixed low-level, and transuranic (TRU) wastes;

- facility engineering, maintenance, operations, utilities, and fire protection services throughout the Laboratory; and
- coordination of institutional requirements and issues with the Facility Management Council.

3.8.5.5. Project Management (PM) Division

PM Division is primarily a service organization that provides project management, engineering, and construction expertise and assistance in areas relating to the planning, design, and construction of Laboratory facilities and other physical assets. Services include application of formal systems engineering controls to manage project resources, engineering services, and construction services that drive successful project completion. The division

- provides the central institutional base for the project management core competency at LANL;
- manages line-item, expense, and general plant construction projects;
- establishes and controls project technical scope, cost, and schedule baselines to support successful completion of construction projects;
- directs the Laboratory's acquisition and management of engineering, construction, and design/build contractor services;
- manages the Laboratory's comprehensive site planning process; and
- assists in implementing institutional requirements (LPRs and LIRs) pertinent to facility project management and comprehensive site planning.

3.8.5.6. Performance Surety (PS) Division

PS Division is primarily a service organization that provides expertise and administrative support to the Laboratory in management functions that assure performance. The division

- provides senior managers with relevant ES&H information through performance indicators;
- manages the institutional requirements system;
- provides ES&H training;
- manages the occurrence investigation program;
- manages the Laboratory facility authorization basis program;
- manages the Institutional program for operational readiness reviews;
- manages the Institutional Conduct of Operations Program;
- provides leadership and expertise in ES&H lessons learned;
- provides leadership and expertise in quality assurance;
- provides leadership and expertise in self-assessments; and
- coordinates, maintains, and provides implementing assistance for institutional requirements relating to performance assurance.

3.8.5.7. Emergency Management & Response (EM&R) Group

Residing in the Security and Safeguards (S) Division, EM&R is responsible for institutional planning and response for emergencies occurring on DOE/LANL property. In this capacity, EM&R

- trains and maintains emergency personnel, including incident commanders, other response personnel, and LANL emergency directors;
- maintains the Emergency Operations Center (EOC) and Alternate EOC in an operational readiness condition;
- serves as the Laboratory's interface with surrounding jurisdictions and entities on emergency response, planning, and preparedness matters;
- responds to emergencies, including assessment, classification, notification, mitigation, and recovery;
- establishes and implements a drill and exercise program; and
- coordinates, maintains, and provides assistance for the Laboratory's Emergency Management Plan and other institutional requirements (LPRs and LIRs) relating to emergency response.

3.8.5.8. Audits and Assessments (AA) Office

AA conducts formal audits, assessments, and evaluations of Laboratory facilities and operations. This office is responsible for

- developing and implementing an internal independent assessment program;
- facilitating the development, tracking, and evaluation of the status of corrective action plans for both internal and external ES&H appraisals;
- serving as the central point of contact, coordination, and support for all external and internal ES&H assessments; and
- serving as the central point of contact with the Defense Nuclear Facilities Safety Board (DNFSB);

3.8.5.9. Business Operations (BUS) Division

BUS manages and coordinates the Laboratory's institutional processes for resource planning, prioritization, and management and for establishing subcontracts. They also provide services for packaging and transportation (P&T) of radioactive and hazardous materials.

In these roles, BUS

- provides institutional processes for managing resource planning and prioritization to meet ES&H needs;

- provides processes for managing the ES&H needs of contractual relationships with Laboratory subcontractors;
- coordinates, maintains, and provides implementing assistance for institutional requirements (LPRs and LIRs) relating to P&T;
- serves as the central point of institutional contact, coordination, and support for interfaces with P&T regulators, including the DOE and Department of Transportation (DOT);
- provides P&T performance feedback and recommendations to Laboratory organizations; and
- provides P&T support and services throughout the Laboratory.

3.8.6. Nested Safety and Security Committees

The Nested Safety and Security Committees function as a management organization that addresses operational issues, including budget priorities. The committees review, manage, and ensure quality and completeness of incident investigations and lessons-learned communications.

Chaired by the senior manager in each organization, Nested Safety and Security Committees include the managers' direct reports. A Director's Central Safety and Security Committee serves as the top-level decision-making body for establishing ES&H policies, priorities, and goals.

Nested Safety and Security Committees reside within the line organizations as conduits for sharing information and communicating decisions. Directorates, divisions, group level, and team level organizations have Nested Safety and Security Committees. Every employee should be a member of a first level team or group committee. The leaders of each level become members of the next level in continuous succession to the Director's Central Safety and Security Committee. This process links levels escalating unresolved issues and promoting two-way communications. Consistent with Higher Education Employer/ Employee Relations Act (HEERA) policy, the membership of Nested Safety and Security Committees must include non-supervisory workers at least at the lowest organizational level.

3.8.7. Other Safety Committees

Laboratory-wide ES&H committees provide specialized expertise for meeting specific institutional requirements. Commonly referred to as institutional "safety" committees, these committees (1) have a strong relationship to ES&H issues; (2) have a technical or operational, rather than organizational focus; and (3) have a Laboratory-wide scope. Committees are chartered in response to specific laws, LIRs, or best work practices. Committee members comprise experienced Laboratory experts from a particular discipline, with some committees having members external to the Laboratory. Every committee is accountable, auditable, and reports to a specific Laboratory manager, who serves as champion for the committee for issue resolution, funding approval, membership, reporting, and communicating with Laboratory senior management.

Committees may be authorized either to approve work activities or to serve only in an advisory role. In either case, the safety- and environment-responsible line-management chain retains the ultimate responsibility for authorizing and directing the work and ensuring it is done safely. Some committees, however, have the authority to permit or prohibit work, as mandated in their committee charter.

Charters for each committee contain a discussion of the committee's purpose and a statement of their authority. Charters also establish provisions for membership appointment and terms, reporting structure, funding mechanisms, and other information relating to the functions of the committee. Laboratory safety committees are created and dissolved as requirements change, and charters contain sunset clauses to ensure that justification for continuation is reaffirmed periodically. The Associate Director (AD) for Operations oversees the committees, establishes essential funding mechanisms, and ensures that these requirements are met.

HSR-DO maintains a listing of Laboratory safety committees and current committee chairs that can be accessed through the LANL home page under the general topic of safety.

3.9. Application of Accountability

ES&H responsibilities are delegated down from the Laboratory Director, through the safety and environment-responsible line-management chain, to the individual worker. Commensurate authorities support these responsibilities in various ways, such as stop work authority and responsibility, safety concerns, self-readiness checks, employee involvement in hazard control plan (HCP) development, etc. Therefore, each individual in this chain must hold themselves and their subordinates accountable for all delegated responsibilities.

All members of the workforce, from the lowest to the highest level, are accountable for meeting the Laboratory's ES&H expectations. Accountability accompanies responsibility, and it belongs to every individual at the Laboratory. Accountability is a neutral concept, implying neither reward nor punishment, and is an implicit contract with expectations. Accountability means communicating to those expecting results, the status and outcome of activities. Consequences then follow that are either positive or negative.

The Laboratory investigates all incidents that affect, or potentially affect, worker safety, the environment, or public health. The purpose of an investigation is to understand both the active errors[6] and the latent errors[7] that contributed to the event. Applying a logic model helps ascertain the relative contributions of the worker(s) involved in the event, the supervisor, and institutional or organizational factors.

[6] The action or inaction of a worker or manager that is thought to directly cause the event.
[7] Contributors, often in the supervisory/management chain, that happen in advance of the event and "set up" the worker action.

Although rare, sometimes controls (procedures, barriers, protective equipment) put in place to ensure ES&H expectations are violated. Because people generally take actions they believe are the "right" thing to do under the circumstances, we must look to see if there were circumstances outside the control of the individual that "set up" the action such that another person, given the same situation, would probably have acted in the same manner. If this is the case, "blame" is most likely to be appropriately placed somewhere in the management chain or with the institution itself. Cases where there is a management or institutional contributor are aggregated and further analyzed to determine whether the problem is isolated or systemic.

In cases where the worker or supervisor choose to disregard or choose to fail to deliver on a responsibility, consequences are serious. The Laboratory uses a progression of disciplinary actions to correct behaviors that are not consistent with Laboratory expectations. The Laboratory's disciplinary policy is documented in the *Administrative Manual* as AM 112. Additionally, the Laboratory has adopted a consequence matrix[8] for poor ES&H performance to guide appropriate disciplinary actions for both supervisors and other members of the workforce. The presence of systemic institutional ES&H issues could result in disciplinary action being applied throughout the management chain, up to and including the Laboratory Director.

In cases where it is determined that an "honest mistake" was made or that a systemic institutional problem caused the action, necessary corrective actions are taken. Such corrective actions can range from advising the worker or supervisor to prevent a recurrence, to additional training, to completely reengineering a Laboratory process.

[8] Found as Table 100.1 of the *Laboratory's Administrative Manual*.

4.0 Supporting the Five-Step Process

4.1. The Institutional Requirements System

Expectations, or standards, for the safe and environmentally responsible performance of work at the Laboratory are established at the institutional, facility, and activity levels and comprise the Laboratory's overall standards and requirements system. WSS and LIRs are selected and written respectively by focus teams of workers from throughout the Laboratory who understand the work. Thus, institutional expectations are created by reviewing the work throughout the Laboratory. These expectations are then used as requirements at the facility and activity levels. As necessary, local requirements may exceed institutional expectations.

4.1.1. Work Smart Standards

4.1.1.1. NNSA/LASO Directed Work

The Laboratory uses the DOE "necessary and sufficient" (N&S) process as prescribed in DOE Policy 450.3-1, DOE Closure Process for Necessary and Sufficient Sets of Standards, January 25, 1996, to establish its contractual requirements. These requirements are called "work smart standards."

A formal institutional change-control process maintains, revises, and ensures the integrity and sufficiency of the Appendix-G WSS and the flow down of supporting requirements.[9] This process is implemented by agreement between the DOE and the Laboratory, with advice and concurrence of the University. The Los Alamos ISM Change Control Board (CCB) serves as the WSS Convened Group (Appendix A), and recommends to the DOE Contracting Officer changes to the Appendix-G WSS set, based upon a formal review and communication process. The change process is coordinated and managed by the Operational Integration Office (PS-OI) and includes appropriate representatives from the Laboratory, DOE, and UC.

4.1.1.2. NNSA/NVSO Directed Work

BACKGROUND. The NNSA/NSO Change Review Group (CRG) represents the convened group of contractor, user laboratories, and DOE representatives for the NNSA/NSO community who have adopted the NV-WSS by contract or agreement and are subject to DEAR 970.5204-78, *Laws, Regulations, and DOE Directives.* The primary goals of the CRG are:

- To maintain, the set of NV-WSS and the Tri-Lab WSS set which provides confidence that the public, the workers, and the environment will be protected

[9] See LIR 301-00-00, "Managing Change Control of Laboratory Operations Standards and Requirements."

from adverse consequences and that work will be accomplished in a cost effective manner.
- To maintain integrity of the DOE approved methods of defining ES&H Standards consistent with DEAR 970.5204-78 and contract requirements.

The work smart standards in Appendix G of the UC-DOE contract were selected in late 1997 using the DOE's necessary and sufficient process. This set of standards must be altered periodically in response to changes in DOE orders, consensus standards, and the work of the Laboratory. A process similar to that used to create the original list in Appendix G is used to change it. When a reason for a change is identified, a Laboratory-DOE focus group is formed to determine and recommend to the ISM CCB actions to be taken. The ISM CCB then acts as the convened group to accept, reject or recommend other actions. If the change is accepted by the CCB, it is taken forward to the UC and DOE contracting officer for incorporation into Appendix G.

For additional details see NV.M45.3XA Chapter 1, Attachment 2.

The responsible division for the LANL activities at NNSA/NSO shall be responsible for assuring this process is implemented which includes the selection of the NNSA/NSO CRG members.

The NNSA/NSO Change Review Group (CRG) Los Alamos National Laboratory (LANL) members shall assume the role of interfacing between the Nevada CRG and the Los Alamos Change Control Board (CCB) by providing the necessary documentation to CRG and CCB membership. This documentation will reflect all changes affecting Tri-Lab Work Smart Standards at NNSA/ NSO and Work Smart Standards at LANL.

The requirements for the LANL representatives on NNSA/NSO CRG and their responsibility to the LANL ISM CCB include the following:

- Complete required training for NNSA/NSO CRG membership and LANL ISM CCB membership.

- Assure that NNSA/NSO CRG and LANL ISM CCB Work Smart Standards actions are well understood by both groups.

    - Brief to the LANL ISMCCB the WSS related actions of the NNSA/NSO CRG.
    - Brief to the NNSA/NSO CRG the WSS related actions of the LANL ISM CCB.
    - Alert both WSS responsible parties (CCB and CRG) to possible conflicts between the two WSS sets.

- These members shall be non-voting members of LANL ISM CCB.

Nevada Site Office NNSA/NSO is responsible for maintaining the Tri-Lab Work Smart Standards Lists thru the activities of the NNSA/NSO CRG.

4.1.2. Laboratory Performance Requirements (LPRs)

Appendix-G institutional requirements are numerous, subject to interpretation, and difficult to apply at the activity and facility level. The Laboratory accordingly established "workplace functional" internal institutional requirements, drawn directly from the Appendix-G standards. The highest-level internal requirements, LPRs establish institutional performance expectations and reference directly the mandatory Appendix-G standards. LPRs include performance criteria that, when met, ensure the LPR and, hence, the WSS are met.[10] LPRs are grouped into six categories: worker health and safety, environmental protection, P&T, facilities management, emergency preparedness and management, and ISM.

4.1.3. Laboratory Implementation Requirements (LIRs)

If there is sufficient reason to require consistency in implementation for meeting a performance requirement, the Laboratory issues a LIR. This document specifies the requirements that must be consistently implemented by all elements of the Laboratory to which the requirement applies. LIRs stem directly from the LPRs and provide detailed mandatory implementing requirements. Contents of the LIRs also derive from Appendix-G standards and are the responsibility of SFMs and cognizant OICs.

Every LIR is owned by an OIC[11], who coordinates input to its contents and ensures that it is kept current. OICs are also responsible for ensuring that their LIRs cover the expectations contained in the Appendix-G standards and LPRs. Generally, SFMs or OICs identify the need for new or revised internal institutional requirements documents (LPRs and LIRs) and submit proposals to their line management and PS-OI.

Per LIR 301-00-01, "Issuing and Managing Laboratory Operations Implementation Requirements and Guidance," each division leader appoints a POC who acts on behalf of their organization to coordinate communication on institutional requirements among the organization, the OICs, and PS-OI. Other organizations may also appoint a POC. The POCs determine and communicate the applicability (i.e., organizational relevance) of institutional requirements to the PS-OI. If an organization's work does not involve the hazards or directly relate to the subject of the Laboratory requirements, then the requirements are not applicable to that organization. Nuclear facility requirements, for

[10] Changes to LPRs follow the process cited in LIR 301-00-00.

[11] The Laboratory assigns an OIC for each LIR. The OIC is normally the Laboratory group or office responsible for establishing, coordinating, and supporting the implementation of a requirement and any associated guidance. When requested, the OIC shall provide consistent subject matter expertise to Laboratory organizations in interpreting and meeting requirements contained in standards, laws, and regulations that are promulgated as requirements in the LIR(s) they are assigned. PS-OI maintains a current list of OICs and their assigned LPRs, LIRs, and LIGs.

example, do not apply to the administrative building. The POCs solicit input for creation and revision of requirements, communicate new requirements to appropriate parts of their organization, and monitor and "self-report" the implementation status of all LIRs applicable to their organization.

Figure 8 illustrates the connection and flow of all Laboratory requirements from the UC-DOE contract to work. WSS, DOE orders, laws, and requirements are found in Appendix G of the contract.[12]

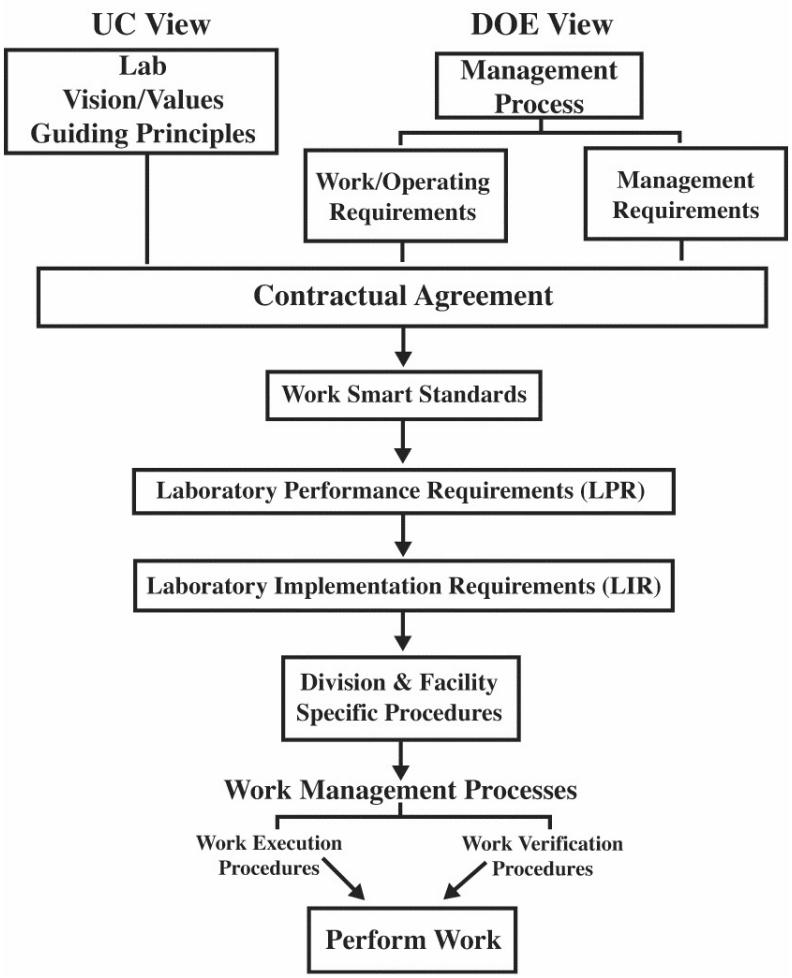

Figure 8. The flow down of requirements from the UC-DOE contract to the work.

[12] A document that shows the traceability of ES&H WSS and other contractual requirements is available on the LANL Operations Requirements/Guidance home page, "Crosswalk – Work Smart Standards to LPRs/LIRs."

Laboratory requirements generally fall into two major categories: those that establish required management processes and those that establish technical requirements or specific hazard controls.

Management LIRs establish mandatory processes to be used by Laboratory organizations, facilities, and Laboratory workers. These include formal processes used throughout the Laboratory for establishing the expectations and requirements at the facility and activity levels. Examples include the LIRs that establish Laboratory-wide requirements for Facility-Tenant Agreements, facility work control, and SWP. These management LIRs define the explicit institutional consistency, formality, and rigor needed for establishing facility- and activity-specific expectations. This also allows for expectations established at these levels to be tailored to meet the specific needs of widely disparate facilities and activities. Management LIRs also establish institutional requirements in other areas, such as reporting occurrences, developing and maintaining safety basis documents for nuclear facilities, and managing hazardous waste.
LIRs that establish technical requirements identify and prescribe explicit administrative or engineered controls for specific hazards. The required controls are mandatory anywhere throughout the Laboratory where the related hazard exists as part of the work activity. For example, technical requirements LIRs might establish specific controls that are necessary for high-radiation areas or confined-space entry. Some technical requirements also establish specific performance criteria for controls; e.g., HEPA filters must be 99.999% efficient or hearing protection must reduce the sound level to a specific value at the eardrum.

In addition to LIRs, Laboratory implementation guidance (LIGs) documents provide discretionary (i.e., non-mandatory) guidance, or good business approaches, relating to ES&H practices. LIGs are coordinated by the cognizant OICs and maintained on the Web as official Laboratory documents.

In special cases, Laboratory requirements and guidance can also be established and communicated quickly throughout the Laboratory via urgent memorandums, alerts, and notices. The urgent memoranda, alerts, and notices are similar in purpose, but vary in their urgency, distribution, and formality of purpose.

All LPRs, LIRs, LIGs, alerts, and notices are official Laboratory documents and are published for workers and managers on the Web through the Laboratory Home Page.

4.1.4. Requirements Management Process

The Laboratory processes for developing, revising, documenting, communicating, maintaining, and managing LIRs, LIGs, urgent memoranda, alerts, and notices are established and described in detail in LIR 301-00-01, "Issuing and Managing Laboratory Operations Implementation Requirements and Guidance." This LIR is supplemented by LIG 302-100-03, "Guide for Developing Laboratory Operations Implementation

Requirements and Guidance." The processes established in this LIR and LIG are managed and coordinated by PS-OI. LPRs and the overall institutional operational requirements hierarchy are managed through the process described in LIR-301-00-00, "Managing Change Control of Laboratory Operations Standards and Requirements."

The SFMs or OICs solicit input from affected workers, the DOE, subject matter experts (SMEs), and other stakeholders, then draft and complete new or revised documents. Conflicts among different organizations are resolved via an established process of management review up through the AD for Operations, as required. Upon final approval by the OIC's division-level line manager, new requirements documents are placed on the Web by PS-OI and are communicated to all Laboratory organizations.

The official record and listing of institutional ES&H expectations exist electronically on the Web under the "Official Documents" section of the Laboratory home page. In addition to LPRs, LIRs, and LIGs, there are listings of all ES&H lessons learned, as well as forms and templates, such as Radiological Work Permit, Waste Profile Form, Crane Operator Safety Checklist, and Unreviewed Safety Question Determination and Screening Worksheet. Only institutional requirements documents residing on the Web are official Laboratory requirements.

4.1.5. Exceptions and Changes

The Laboratory has a formal process by which organizations can obtain exceptions or variances to Laboratory requirements. This process is defined in LIR 301-00-02, "Variances and Exceptions to Laboratory Operations Requirements." Given valid justification, organizations can obtain a written exception or variance from established institutional requirements as long as equivalent or compensatory measures are in place. Variances must be approved by the cognizant OICs and their division-level line manager; exceptions, however, must also be approved by the AD for Operations.

Requirement documents not specifically listed in Appendix G can be changed at the discretion of the Laboratory. Proposed changes or interpretations of institutional expectations (LPRs, LIRs, or LIGs) can be submitted in writing by any member of the workforce through their organization's POC to the appropriate OICs. For those LPRs and LIRs that are listed in Appendix G, changes must also be accepted by DOE through the WSS closure process and the contract modification process.

4.1.6. Applicability and Implementation of Requirements

LIR 301-00-01 requires that POCs declare which LIRs are applicable to their division and when the applicable LIRs are implemented. POCs also must notify PS-OI when a notice has been received, indicating if the requirements are applicable and if they will be implemented. For POC declarations to be meaningful across the institution, the definitions of applicability and implementation must be understood and applied uniformly.

A LIR is applicable in an organization if it covers work, including administrative tasks, being performed by anyone in the organization. This means that the managers and supervisors of an organization must have a thorough understanding of both the work performed by every individual and the Laboratory's requirements. The understanding of the work can be derived from authorization basis documents, Facility-Tenant Agreements, FSPs, or work inventories required in LIR 300-00-01, "Safe Work Practices." It is the responsibility of the POC to understand the content of the Laboratory requirements and make the necessary connection with the work being performed; but it is the responsibility of the DL to assess both the performance of the POC in making the determination and the organization's implementation of the Laboratory requirement.

A LIR is implemented within an organization if the work, including administrative tasks, is performed either according to the requirements of the relevant LIR(s) or to other suitable requirements that have been granted by a variance (per LIR 301-00-02) to perform the work. This means that the individuals performing the work and their supervisors are aware of the LIR(s) and understand and meet the work requirements. Note: An exception, which must be approved by the AD for Operations, exempts the organization from implementation of the requirements in a LIR.

Institution-wide implementation is achieved when all organizations have established and consistently employ work practices that meet the requirements of the applicable LPRs and LIRs, and any deviations have been approved through the variances and exceptions process (LIR 301-00-02). A satisfactory level of implementation can include some local defects and opportunities for improvement. Some of the requirements are new, so deficiencies may not be evident until implementation is attempted. There may be individual cases of noncompliance, but these should not show a systemic nonconformance to the institutional requirements.

4.1.7. Quality and Conduct of Operations

The Laboratory is incorporating quality assurance into the institutional requirements. LPR 308-00-00, "Integrating Quality Management," identifies 10 quality criteria that (if applicable) must be satisfactorily addressed in all Laboratory standards, requirements, policies, and activities, regardless of whether the work is conducted in a nuclear or non-nuclear facility.

LPR 308-00-00 constitutes the quality management plan for the Laboratory. Organizations may choose to develop their own quality management plans that further elaborate on the requirements of the 10 criteria of LPR 308-00-00. Alternatively, management may choose to issue their own operational documents (e.g., procedures, work instructions, etc.) that meet the 10 criteria of LPR 308-00-00. Regardless of the implementation approach, management must employ a risk-based graded approach to applying the criteria of LPR 308-00-00 to its organizations, programs, projects, and activities.

LPR 308-00-00 serves as the quality umbrella document for all LPR and LIR documents. All such documents must explicitly address the applicable requirements of LPR 308-00-00. Furthermore, all new or modified LPRs and LIRs are subject to an independent review to determine whether the 10 criteria of LPR 308-00-00 have been adequately met, and organizations that draft or modify LPRs and LIRs must take steps to ensure that review findings are adequately addressed prior to publishing the LPR or LIR.

The Laboratory is committed to performing its work with a formality commensurate with the risks of its work. The degree of formality is derived from DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities." The Laboratory performance requirements are in LPR 310-00-00, "Conduct of Operations."

4.2. Work Management Processes

4.2.1. Institutional-Level Processes

Institutional expectations apply Laboratory wide to the entire workforce. These expectations derive from statutory requirements, contractual agreements between UC and DOE, consensus standards, and Laboratory practices. Contractual ES&H agreements between UC and DOE are based upon standards identified jointly by DOE, the Laboratory, and other stakeholders. The Laboratory commits to full compliance with all applicable federal, state, and local laws and to regulations and contractual obligations, unless formal relief is obtained from the cognizant agency.

At the institutional level, Laboratory-wide ES&H expectations are established, using the DOE's WSS process. This yields a set of UC-DOE contractual work standards. The contractual standards are included, by reference, in the UC-DOE contract. Changes to the UC-DOE contractual set of work standards are subject to DOE negotiation and approval.

4.2.2. Activity-Level Processes

The Laboratory uses "Safe Work Practices" (LIR 300-00-01) and "Facility Management Work Control" (LIR 230-03-01) to establish minimum expectations for the control of activity-level work. A Laboratory-wide approach requires that all work be authorized by the line-management chain or supervisors based on the level of risk and the reliability of the hazard control system. Similarly, workers are authorized to engage in work based on management's acceptance of their knowledge, skills, and abilities to conduct work safely and in an environmentally responsible manner within the authorized hazard control system.

At the activity level, the scope of the work may be narrowly defined to encompass only a specific task or generically defined to include a class of activities or hazards. The workforce establishes and incorporates activity ES&H expectations using the first three core functions: define the scope of the work, analyze the hazards and associated environmental impacts, and develop and implement the controls. Safety- and

environment-responsible line managers authorize work only after the first three functions have been completed. Safety- and environment-responsible line managers must know their employees' work and control systems sufficiently to be satisfied that the work can be authorized and is within their employees' competence. Formality, rigor, and the extent to which employees perform the three functions are determined by line management and are commensurate with the magnitude and uncertainty of the risks. The DOE may be involved in authorizing Laboratory work when appropriate.

LIR 300-00-01, "Safe Work Practices," establishes the institutional process to be followed by all line management organizations for establishing activity-specific safety and environmental expectations. This LIR establishes requirements for the authorization of work and the workers, based upon a formal process for defining the work, analyzing its safety hazards and potential impact to the environment, and identifying and establishing appropriate controls. The LIR, along with its companion LIR 300-00-02, "Documentation of Safe Work Practices," also establishes the institutional requirements for documenting activity-level safety analyses and controls. Such analyses and controls are to be documented in HCPs.

4.2.2.1. Hazard Control Plans

The SWP process establishes three levels of rigor in the authorization of the work and workers. These levels are tied to the management level of authority necessary to authorize work, depending upon a combination of the risks and hazards before and after controls are applied. For example, activities with higher associated risks must be reviewed and authorized by division-level line management, while lower risk activities can be authorized at commensurably lower management levels. Higher risk activities also require peer or SME reviews prior to authorization. As part of the SWP process, the safety- and environment-responsible line-management chain must identify relevant institutional and facility expectations (including environmental objectives and targets) and incorporate them as part of the activity-level controls, including the use of Laboratory permitting systems and processes.

Facilities that support the performance of work have established operating limits and safety envelopes, as described in the FSPs. Through these and Facility-Tenant Agreements, facilities communicate their facility-specific expectations for the safe and environmentally responsible conduct of work, and may establish specific requirements for inclusion in the SWP review process.

4.2.2.2. Work for Others (WFO)

WFO is work that is sponsored by a funding agency other than the DOE, including other government agencies and private industry.

ISM and the Laboratory ES&H requirements that flow from Appendix G of the UC-DOE contract apply to WFO and work for DOE with the same force and effect. WFO activities must meet all applicable institutional, facility, and activity requirements. The line-

management chain is responsible for the safe and environmentally responsible performance of work. Classification of a program shall not shield the activity from working within the Laboratory's safety and environmental management system. Work that cannot be performed safely and in an environmentally responsible manner shall not be started, and work that is not being done within the safety and environmental requirements shall be stopped and restarted only after specific upgrade and review of the safety and environmental systems.

4.2.2.3. Facility Work Activities

Facilities and facility work are defined in LIR 230-03-01, "Facility Management Work Control." FMs directly manage facility work, which covers all activities involved in the construction and maintenance of the constructed environment and other physical assets of the facility. The FM through their organization follows the established institutional processes defined in the LIR for the management and control of such work. The LIR establishes, for example, a hazard analysis process to be followed for all facility work. LIR 402-10-01, "Hazard Analysis and Control for Facility Work," describes the process. The processes for authorization of work and the close out of the work are defined in LIR 230-03-01.

4.2.3. Facility-Level Processes

4.2.3.1. Facility Management

All Laboratory space, including land, physical structures and facilities, is assigned to owning DLs and becomes part of an FMU. An FMU can include multiple facilities, buildings, other structures, and large areas of land. In some cases, several FMUs may be grouped into facility management zones to share necessary ES&H and maintenance resources.

Each FMU has a facility management team that provides the infrastructure, processes, and resources required to effectively support its unique needs. For each facility or building within an FMU, the facility management team works with tenant organizations to establish facility-specific ES&H expectations. Facility expectations comprise defined limits, boundaries, and facility processes to ensure (1) that the current ES&H capabilities of the facility (commonly referred to as the facility operating limits or safety and environmental envelope) are not exceeded, and (2) that regulatory requirements and institutional expectations are met. FMs also establish the requirements for interfaces among tenants, the facility management team, and support organizations.

The implementation of relevant institutional requirements is the responsibility of the safety- and environment-responsible line-management chain. In practice, this applies to both facility and operating organizations. Facility-owning DLs and their facility management organizations are responsible for implementing the management LIRs that define facility expectations and for implementing the LIRs for the facility activities that they perform.

4.2.3.2. Facility-Tenant Agreements

Facility-Tenant Agreements are defined in LIR 250-02-02 and LIG 250-02-02, "Facility-Tenant Agreement." The Facility-Tenant Agreement formally establishes and helps ensure mutual understanding of the safety and environmental roles and relationships between the facility management organization and the tenants doing work in the facility. Facility-Tenant Agreements are written for all Laboratory facilities; completing the agreement is the responsibility of both the FM and the tenant organization.

4.2.3.3. Facility Safety Plans (FSPs)

The FSP is the primary mechanism to help FMs establish, document, and integrate facility-level expectations. The purpose of an FSP is to systematically evaluate and document the work in a facility, its hazards, and the facility-specific controls from the standpoint of the facility-wide operating limits. The institutional requirement for FSPs is established here and in LPR 240-01-00, "Facility and Operating Limits and Configuration." LIG 240-01-10, "Facility Safety Plan," provides additional institutional guidance.

Establishing and documenting the FSP is the responsibility of the facility owner and is usually delegated to the FM. Consistent with the process for establishing institutional expectations, establishing the FSP begins with understanding the work and its hazards; involves the people doing the work, SMEs, and stakeholders; is tailored to the work; incorporates applicable external standards; and complies with statutory requirements.

The FSP describes the collective work of an FMU (or facility, building, or other subset, depending upon the hazards). Within the plan, the FM analyzes a facility's hazards and environmental aspects and identifies facility-specific expectations and controls to effectively manage risks (i.e., fulfills the first three core functions). The FSP contains a definition of the facility's ES&H safety and environmental envelope and a description of the facility's administrative and engineering controls. It includes and is consistent with institutional expectations (i.e., LPRs, LIRs**,** LIGs, Laboratory forms and templates, and other institutional requirements).

Given the dynamic quality of experimental operations, it may be necessary for FSPs to incorporate mechanisms for the selective review of HCPs to ensure that work stays within facility operating limits and safety envelopes.

The FSP may be a single document that references other documents, such as Facility-Tenant Agreements, facility procedures and manuals, safety analysis reports (SARs), facility permits, emergency plans, waste management plans, pollution prevention plans, quality management plans, tenant operating envelopes, and conduct-of-operations plans. The FSP and any other documents or permits that govern work in the FMU form the authorization basis of that FMU. The level of detail of the work description, the rigor of hazard analyses, and the nature of required facility processes and controls in an FSP

document are consistent with Laboratory criteria and are commensurate with the magnitude of the hazards associated with the facility.

4.2.3.4. FSP Levels of Rigor

Two distinct levels of rigor exist for FSPs: one for facilities requiring authorization agreements with the DOE and another for those that do not. The former reflect much more extensive analysis and formality of operations, consistent with the magnitude of underlying hazards. Many of these facilities are also nuclear and radiological facilities, requiring the application of special management LIRs and associated Appendix-G standards. FSPs for non-nuclear facilities are appropriate to the non-nuclear hazards and associated risks, but generally do not require separate authorization agreements with the DOE.

For nuclear or high-hazard non-nuclear facilities, a FSP may include DOE-prescribed requirements, such as final safety analysis reports (FSARs), technical safety requirements (TSRs), safety analysis documents (SADs), or unreviewed safety question determination (USQD) programs. Alternatively, facilities having only low-hazard activities may have short FSPs that mainly reference institutional programs or a few facility-specific documents, such as emergency evacuation plans.

4.2.3.5. Changing FSPs

The FSP also addresses how expectations are maintained and establishes mechanisms to ensure modification of the FSP when work or hazards change. Maintaining expectations may include processes such as Facility-Tenant Agreements and FM-support agreements; review of HCPs; surveillance requirements (SRs); change control; configuration management; and assessments. The FSP addresses the means for identifying changes in activities or facility conditions and associated hazards that could result in a need to modify expectations established in the FSP. It may also address processes for allowing exemptions to the FSP or other changes based upon input by workers, SMEs, or stakeholders. For nuclear facilities, modification may include the USQD process.

Except when covered by an agreement with a regulatory party (e.g., regulatory permits or authorization agreements, discussed below), the FSP and referenced documents —but not institutional expectations—may be changed at the discretion of the owning DL. Proposed changes or interpretations are submitted in writing by any member of the workforce to the facility-owning DL. Disagreements regarding the ES&H expectations in the FSP shall be resolved within the supervisory chains of the owning DL and the organization proposing the change. Ultimately, the facility owner has the authority to determine facility-specific requirements in the FSP consistent with Laboratory expectations.

5.0 Training

An essential aspect of preparing for work is ensuring that the workforce possesses the level of experience, knowledge, skills, and abilities to safely and effectively discharge their responsibilities. The Laboratory's training programs build the knowledge, skills, and abilities of the Laboratory workforce, commensurate with their assigned jobs, to support the safe and environmentally responsible performance of Laboratory work. The Laboratory's systematically designed training program, delivered by decentralized organizations with centralized program management, provides the workforce with institutional, facility, and job-specific training.

Laboratory-wide training organizations offer training courses and programs to train the workforce in accordance with applicable laws, regulations, orders, and Laboratory requirements. Line managers ensure that workers receive training commensurate with job assignments. Laboratory facility owners identify and design worker qualification and certification programs for workers performing jobs that have significant risks to facility systems.

The institutional Laboratory training requirements are based on LIRs, CFRs (Codes of Federal Regulation), and Appendix-G of the UC-DOE contract. Facility- and job-specific training requirements are based on the risks and hazards specific to each work activity and facility. Job-specific training takes into account safety, knowledge, and skill requirements. The Laboratory Training Questionnaire (in LIR-300-00-04) is an institutional tool available through the Virtual Training Center for line management development of worker training plans. The Employee Development System (EDS) is the Laboratory's official database of training records for UC and contract employees, including the training records of subcontractors. Training data recorded and reported in EDS includes course and worker training histories, training plans, training notifications, and training status reports. Electronic training plans in the EDS enable the Laboratory to track a course or group of courses required for specific workers to perform specific job functions and to check whether the training has been completed or has expired. These plans are an important electronic tool supporting the worker authorization process.

OJT (on-the-job training) is an instructional method for Laboratory workers to receive job-specific knowledge and skills in the work environment. OJT is delivered in a systematically developed and consistent manner and is documented. A graded approach to OJT is used at the Laboratory and takes into account the level of risk to determine the amount of formality to apply to OJT. The higher the risk, the greater the formality required when preparing and delivering the OJT.

The Laboratory also provides opportunities for employees to enhance their professional growth and development through education and career development opportunities, as defined within the UC-DOE contract.

5.1. Senior Technical Managers

Senior technical managers are line managers at the level of DL and above. Senior technical managers must have demonstrated technical understanding of the work and hazards associated with the missions of their organizations. Facility-owning DLs must understand the authorization bases for the facilities and operations they own and be qualified for unescorted access to these facilities consistent with safety requirements.

5.2. All Managers and Supervisors

To maintain the Laboratory's commitment to safety as our highest priority and to ensure the continued integration of ES&H into all aspects of our work activities, it is necessary that managers at all levels find ways to continuously improve their understanding of ES&H. ISM is a part of the required management training curriculum. The AD for Operations determines the on-going ISM training requirements for managers and supervisors.

5.3. Facility Managers

In addition to the training stated above, training and qualification for FMs are consistent with the requirement of LIR 280-01-01, "Facility Management Training and Qualification (FMTQ) Program." This training is coordinated by and is provided through institutional training organizations. The Facility Management Training and Qualification Program consists of two components: core requirements and FMU-specific requirements. See LIR 280-01-01 for a complete discussion.

5.4. Workers

All new workers must take General Employee Training (GET), which provides the employee with basic knowledge regarding safety, health, and the environment. Additional safety training required for workers is based on the job function, the location of the work, and the individual work activities each employee performs. UC employees, support services and protective force sub-contractors, and contract labor personnel complete a training questionnaire to determine the appropriate training and training plans. The training plan is validated on a yearly basis during performance appraisal time or whenever a job function, work location, or activity changes significantly. Additional OJT may be added to individual training plans.

Subcontractors, other than the aforementioned, ensure that all personnel working on a project or at a facility are qualified and trained to conduct the work in a safe, environmentally protective, and efficient manner.

5.5. Workers in Nuclear Facilities

In addition to the training stated in Sec. 5.4, training qualification requirements for workers in nuclear facilities are specified in training implementation matrices (TIM), in

accordance with DOE Order 5480.20A. This ensures that workers and line managers attend the required training and qualification programs needed to perform their work in a safe, environmentally responsible, and efficient manner. TIM are owned by the facilities and managed by the Laboratory Training Integration Office in HR-6, Training and Development.

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6.0 Self-Assessment Processes

6.1. Confirming Readiness

Confirming readiness ensures that all necessary preparatory actions are complete prior to performing work. Depending upon the hazards, confirmation may range from relatively informal walk-downs by members of the supervisory chain to formal readiness assessments performed jointly with DOE.

Line management and non-supervisory personnel observe the activities of the workforce to ensure they meet activity, facility, and institutional expectations. This includes assessing results, identifying process improvements, taking effective corrective actions, and sharing lessons learned. Owning facility DLs ensure that work within their facility meets facility and institutional expectations.

6.2. Assessing Results

The fifth step in the five-step process—ensure performance—confirms that work is performed safely to expectations and in an environmentally responsible manner. Ensuring performance at LANL is principally attained through self-assessment. Self-assessment activities include all internal reviews of performance by either Laboratory workers or contractors. These activities include (1) reviews by personnel independent of the work and the organizations reviewed; and (2) evaluations by line and support personnel of their work. Assessments to ensure performance involve a variety of activities, including collection of feedback, evaluation of incidents and deviations from expectations, corrective actions in response to incidents and deviations, identification of improvement opportunities, and reinforcement of desired behavior. Performance assurance activities may be accomplished through mechanisms, such as performance assessments, audits, workplace observations, and performance measurements. These mechanisms also include processes that ensure performance data are analyzed and lessons learned are shared with other Laboratory organizations. The Laboratory workforce monitors its work, assesses the results, and identifies and implements needed improvements at the activity, facility, and institutional levels to ensure that work performance meets expectations.

Laboratory assessments, including self-assessments, are done by line management and workers, facility owners, SFMs, support organizations, and the AA Office. The objective is to understand the behaviors and processes that support ES&H performance expectations. The assessment process helps preclude major, unexpected ES&H occurrences by enabling continuous ES&H improvement and showing when corrective actions are needed. Assessments are based upon methods and measures selected by and tailored to meet the needs of the assessing and the assessed organizations. Assessment measures determine the degree to which expectations are met, corrective actions are completed, occurrences are investigated, and other performance indicators. Assessment results are documented and reported to the cognizant line managers, who take appropriate corrective actions.

The Performance Indicator Program is another essential part of the Laboratory feedback and improvement process that is used to validate the Laboratory's performance and to measure progress in meeting institution goals and expectations. Laboratory management uses the results of key performance indicators to assist in decision-making and for prioritizing actions to successfully accomplish the Laboratory's mission.

6.2.1. Internal Self-Assessment Process

The Senior Executive Team (SET) has established an integrated self-assessment process to move the Laboratory to a comprehensive approach for assessing progress in meeting institutional expectations and goals. This approach utilizes an integrated management system for embedding ES&H as strategic value into core business processes. The process is built on the framework that high-level objectives and goals cascade down from the SET through the directorate to divisions and finally to the work activity level (see Figure 9). Each division is responsible for tailoring and aligning their objectives, goals, strategies, and metrics to the high-level institutional objectives and goals. Line self-assessment provides the feedback mechanism for reporting up the management chain on how the work is being accomplished and aligned with the Laboratory's mission, goals, and values. This approach establishes a robust self-assessment process that

- gives ownership of self-assessment to line-organizations;
- provides goal setting for each management level;
- facilitates alignment of work activity with mission and goals;
- uses metrics to measure performance;
- assures accountability throughout each level of the organization; and
- uses one integrated reporting system for assessing and evaluating performance.

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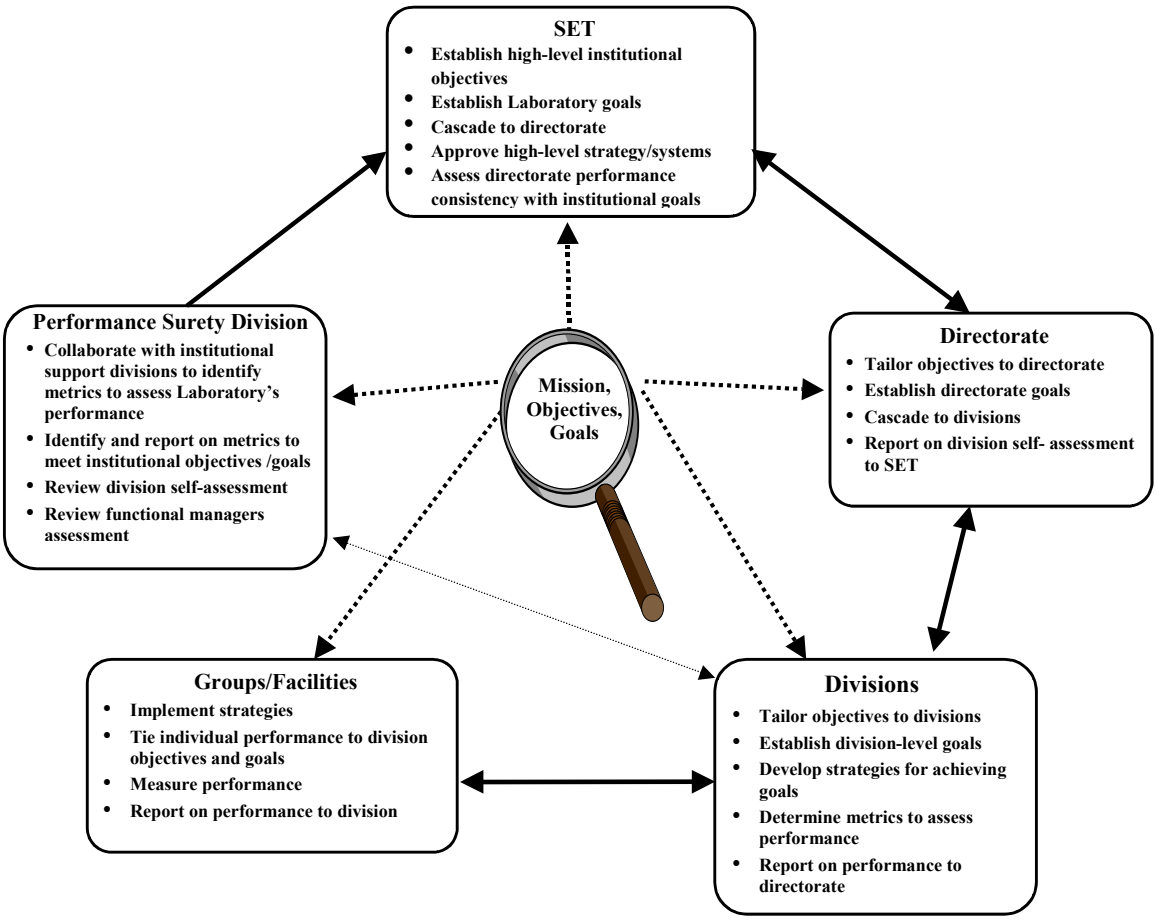

Figure 9. The Laboratory's integrated self-assessment process.

The process contains three key elements:

- the Senior Executive Team (SET);
- the annual institutional self-assessment plan, which results from the decisions and the actions of the SET; and
- division self-assessment plans, which support the institutional plan.

6.2.1.1. Annual Institutional Self-Assessment Plan

The annual self-assessment plan developed by the Director's Central Safety Committee (DCSC) is a key part of improving the Laboratory's feedback and improvement process for ISM. It provides the higher-level direction for the divisional self-assessment plans. This plan

- documents and communicates institutional self-assessment priorities and institutional expectations for line self-assessments;
- ensures consistent performance assessment across the Laboratory;

- identifies internal functional self-assessments to be conducted, using risk management to set assessment frequency; and
- enables effective assessment resource planning by establishing annual schedules for internal line and functional self-assessments and communicating internal, independent self-assessment schedules.

6.2.1.2. Annual Division Self-Assessment Plans

The integrated self-assessment process enables divisions to balance institutional and division safety priorities that are meaningful and value-added to both the institution and the line. The division self-assessment plan is incorporated into the division's ISM description document.

Under the integrated self-assessment process, division responsibilities must establish an annual division self-assessment plan that includes institution and division priorities. The plan must contain or have documentation of the following:

- use of the graded approach, based on risk analysis applicable to work being performed by the division;
- assurance that key ISM mechanisms are effectively implemented;
- confirmation that WSS, authorization basis and FSPs, Facility-Tenant Agreements, FMWC, and SWP are in place, working, and contain feedback loops;
- verification compliance with applicable laws and regulations;
- the division self-assessment schedule;
- results of self-assessment annually;
- applicable corrective actions;
- lessons learned and best practices; and
- periodic assessments and reports of performance on key measures and issues.

The Laboratory's integrated self-assessment process is in the early phases of implementation. It is a work in progress that will evolve into an assessment system that ensures the effectiveness of ISM in creating a safe work environment.

6.2.2. Other Safety and Environmental Assessments

The Laboratory identifies and ranks environmental issues, documents these issues in the annual report of the SFM for Environment, establishes issue-resolution teams with assigned objectives and action plans, and monitors progress toward resolution of those issues through the institution's issues management and corrective actions processes.

The Laboratory's process for identifying and dealing with environmental issues through the ISM System also complies with DOE guidance for an environmental management system, as required in Executive Order 13148, and meets key requirements of an environmental management system, as outlined in ISO 14001. For example, the Laboratory's process for identifying and ranking environmental issues compares with ISO

14001 requirements to identify environmental aspects which are elements of Laboratory operations that impact or have the potential to impact the environment. Creating issue-resolution teams fulfills several ISO 14001 criteria, including creation of objectives, assignment of resources, and definition of ownership and responsibility. Oversight of the improvement process by Laboratory senior managers compares to ISO 14001 requirements for management review. Using ISO 14001 as an environmental management system guideline, the Laboratory performed a gap analysis, comparing the present environmental component of ISM with ISO 14001 requirements, and is working to continuously strengthen the ISM system.

The Laboratory's current environmental assessment process includes the following steps:

(1) identifying and ranking institutional environmental aspects (issues);
(2) developing an issue statement and an issue-resolution objective for each aspect;
(3) submitting these aspects/issues/objectives through the SFM (Environment) Self-Assessment Report to the SET, which decides what issues will be forwarded to the ISM Issues Management System; and
(4) resolving issues and achieving objectives through the ISM Issues Management System, which includes appointing an issue owner, creating an issue action plan, establishing one or more issue performance measures, and closing the issue with the SET after the objective has been accomplished.

Analyzing environmental aspects typically focuses exclusively on negative impacts to the environment. Example aspects include waste generation, water usage, and noise generation. Significant aspects are those that have the greatest potential to adversely impact the environment. To identify and rank aspects, a team of environmental SMEs considers the sum of all Laboratory activities, performing an assessment at the ISM institutional level. Aspects are scored in two steps. In the first step, the following four criteria are used to rank aspects:

(1.) Environmental requirements, such as legal/regulatory drivers, DOE Orders in Appendix G of the UC-DOE contract, and other contractual drivers: For each aspect, is the Laboratory currently not meeting requirements, does it have a history of not meeting requirements, or is it likely to face stricter future requirements that would be challenging to meet?
(2.) Natural resources stewardship: Can a specific aspect of Laboratory operations continue for 100 years without depleting natural resources or otherwise affecting the availability of a natural resource for present or future uses?
(3.) Public health risk: Is a specific aspect of Laboratory operations changing the environment such that an epidemiologically significant impact to public health could occur?
(4.) Public perspective: Will a specific aspect of Laboratory operations lead to a significant public perception that the Laboratory isn’t a good environmental neighbor?

Aspects are scored zero or one against each of these criteria. In the second step, aspects with a combined score of three or four are re-scored. Aspects that are deeply ingrained in Laboratory operating culture and are not being meaningfully addressed are scored as high priorities. The remainder of the issues with scores of three and four are listed as medium priority. The same criteria are used to re-score those issues with initial scores of one and two into the medium and low priorities. Aspects scoring zero in step one are assigned minimal priority. In this way, the aspects are assigned high, medium, low, and minimal priorities—similar to the ranking used in the SWP LIR and in the Issues Management System. High-priority aspects are considered "significant" according to the ISO 14001 formalism.

6.2.3. Institutional Level Audits and Assessments

AA provides the Laboratory with reasonable assurance through assessments and evaluations that Laboratory operations are continuously improved and compliant with internal and external requirements.

AA-2, Internal Assessments Group, evaluates the Laboratory's implementation of environmental protection, safety, and health; quality assurance; and facility management expectations. An independent evaluation emphasizes the performance assurance activities of the assessed organization.

AA evaluates the Laboratory's ES&H performance assurance process and periodically analyzes ES&H function performance. AA-2 is the OIC for independent, internal assessments and is responsible for developing and implementing the internal independent assessment program.

Independent organizations, such as AA, help ensure performance by assessing OICs, facilities, and line organizations for performance relative to institutional expectations (including performance assurance expectations); analyzing results; identifying improvements; and reporting results to management.

6.2.4. UC-DOE Contract Appendix F

ES&H performance at the Laboratory is tracked and assessed through the use of performance measures, which provide agreed-upon objectives, measures, and targets for ES&H performance. At Los Alamos, performance measures are defined jointly by the Laboratory, DOE, and UC and are added to Appendix F of the UC-DOE contract. Success in achieving the objectives defined by Appendix F and the performance measures depends upon the effectiveness and implementation of the expectations established at the activity, facility, and institutional levels.

Laboratory performance is evaluated against the Appendix-F measures through a number of internal and external processes. The Laboratory safety and environmental self-assessment process is defined in LIR 307-01-01, "Self-Assessment," which outlines the requirements for periodic internal performance reviews and line-management self-

assessment reports relative to the Appendix-F measures. Follow-up actions are taken by management to improve safety performance and to meet targets that are established in the measures.

In addition, UC and DOE receive periodic performance reports from the Laboratory. Twice yearly, senior managers meet with UC and DOE to discuss key metric performance and describe action being taken to improve systems and programs. Annually, the Laboratory, UC, and DOE each develop comprehensive assessments of the Laboratory's Appendix-F performance.

6.2.5. Stakeholder Assessments

DOE, NMED, and other regulatory authorities provide ES&H oversight of the Laboratory. This oversight includes routine on-site DOE representatives and periodic audits and reviews. The UC ES&H Advisory Panel provides ES&H oversight. Laboratory self-assessment results, excluding the walk-around data, are given to DOE and other external reviewers.

6.3. Issues Management and Corrective Actions

The Laboratory maintains issues management and corrective processes to ensure that important issues (internal and external) are captured and resolved. This includes the Issues Management Tracking Database I-Track, which is used throughout the Laboratory to evaluate and prioritize ES&H issues, assign the issues for resolution, track the corrective actions to completion, verify that the completed actions resolved the issue, and communicate lessons learned. Line management is ultimately responsible for tracking and correcting all ES&H issues. Support and facility management may track and correct issues relating to institutional and facility levels. Issues are prioritized and resources are allocated for corrective actions, based upon formal or informal cost/risk/benefit analyses. Issues management and corrective actions are evaluated as part of Laboratory assessments.

6.3.1. Incident/Injury/Near-Miss Investigation

The Laboratory recognizes the value of feedback from operating experience to improve performance and is committed to fostering a "reporting culture," where incidents, injuries, and near misses are valued as a source of important data to analyze and educate. The safety- and environment-responsible line-management chain is responsible for meeting DOE ES&H reporting requirements that occurrences (including near misses), accidents, and injuries are reduced and consistently reported. LIR 402-130-01, "Abnormal Events," states the requirements and defines the processes to be used for reporting this information. Abnormal events and workplace conditions that could affect the safety of the worker, the public, the environment, or operational integrity are identified and critiqued in a process that is coordinated by FMs and involves activity-level line managers and institutional service organizations.

The Laboratory complies with criteria for recordable injuries, as well as reportable occurrences, but also maintains near-miss and safety-concern reporting. Coordinated by the responsible FM, involved workers, supervisors, and managers come together with safety and environmental protection experts to evaluate, or critique, the event and to determine causes, corrective actions, and lessons learned. Results of the analysis are tracked in the appropriate system to ensure corrective actions are closed and data are systematically available for trending.

Reportable occurrences and recordable injuries are the subject of periodic self-assessments by line management, both as landlords of facilities and as the safety chain of command for certain tenants. SFMs assess the same data on a crosscutting, or Laboratory-wide, basis to ensure institutional issues are identified.

6.3.2. Safety Concern Program

The Safety Concern Program is a significant part of ISM. A safety program can be effective only with the full participation of the workers—the Laboratory's front-line experts in workplace safety. For this reason, the Laboratory has encouraged full participation in the program.

The Safety Concern Program is a no-fault partnership between Laboratory workers and their managers to record and resolve safety and environmental concerns. Anyone with an active Z-number at Los Alamos, including UC employees, contractors, students, and affiliates, may access the Web site and enter a concern or suggestion.

At the heart of the Safety Concern Program is the Safety Concern System database. Employees may enter concerns on the Web site. These concerns are sent electronically to the submitter's manager, who then evaluates the concern, involves the appropriate supervisors and ES&H personnel, and implements suitable corrective actions. Employees may submit concerns anonymously to the ES&H Hotline, which are then handled in confidence by the Hotline staff.

7.0 Safety Resource Allocation

Laboratory program and line managers are responsible for planning work and for ensuring that expectations for safe and environmentally responsible work are incorporated into all work plans and addressed in resource prioritization and allocation. Institutional ES&H functions are funded by G&A (general and administrative) overhead allocations usually made to the Laboratory infrastructure and support divisions. ES&H for a given facility or programmatic activity are funded either directly by a program or by collection of a recharge, organizational support, or other internal taxation mechanism. ES&H costs for nuclear and high-hazard facilities, which are assumed higher than for other facilities, are direct funded by the Defense Programs and covered in the Readiness in Technical Base and Facilities (RTBF) process.

ISM is owned by the institution–not a single central organization. This distributed ownership necessitates that people in support and operating organizations perform ES&H-related work at the request of the institution. Questions then arise about payment for this work. The institution has established policies and practices related to various common situations. These policies and practices are based on the fundamental requirement of ISM that ES&H be part of everyone's job and of all work performed at Los Alamos. The following points codify the Los Alamos policy on organizational charges for institutional ES&H work:

- When a requirement for an institutional ISM-related activity is approved by the Laboratory Director's Office, the cost associated with the implementation of this policy will be borne by the individual divisions or groups and charged to the appropriate direct or indirect program code. Examples of such requirements are writing Organizational ISM Descriptions and serving on focus teams that create institutional requirements.

- If the Laboratory requires the services of staff to work on unique or extraordinary projects that are clearly institutional in nature and do not fall within individual division or group ES&H responsibilities, the institution will provide funds, generally from the G&A account. Creating the Computerized Maintenance Management System is an example of a unique project that was supported by institutional funds. In most situations, however, the staff who are required to develop policy and procedures that will ultimately be deployed in the Laboratory should be charged to their individual divisions, FMUs, or groups.

- Divisions or groups that may foresee requiring the services of other organizations should contact those organizations so they can budget and rank these requests for services in the annual planning process.

ISM is related to planning and resource management in that BUS works with Laboratory organizations to price safely performed work.

Laboratory program and line management must have a thorough understanding of the cost of ES&H. The cost of ES&H is not limited to the cost of administering the ES&H program. It also includes costs that result from lost workday cases, management time spent responding to ES&H incidents, legal settlements, and other costs associated with the failure to meet requirements and apply the five-step process. These costs are a significant portion of total ES&H costs and may even exceed the costs of administering the Laboratory's ES&H program. Through such a comprehensive review of ES&H costs, the Laboratory may be able to adapt Philip R. Crosby's philosophy "quality is free" to the ES&H program. The analogous concept of "ES&H is free" would promote recognition of the benefits of doing things responsibly each and every time. By stringently adhering to Laboratory procedures and processes, the Laboratory can avoid accidents or environmental damage and the associated high cost of responding to them.

7.1. Indirect Budgets

ES&H activities that are considered institutional in nature or are part of a facility management unit that is funded through the Laboratory's recharge and organizational support mechanisms are included in the Laboratory's indirect budget.

Senior management recognized the need to assure an integrated Laboratory-wide viewpoint. The ADs are responsible for the oversight, coordination, assurance of Laboratory-wide focus, and encouragement of creative approaches for achieving efficiencies. The ADs work together to integrate the budget and develop final recommendations.

Following this approach, the indirect budget process is conducted as a line-management planning and budgeting effort. The Laboratory has indirect budgets submitted annually and makes interim approved quarterly adjustments, as required. Each AD is responsible for establishing a process within their directorate for developing indirect budgets by working with each of their division leaders to develop budgets, review them, and prepare final recommendations for all indirect activities in the directorate.

The indirect budget process is a mechanism by which divisions can identify many unfunded ES&H issues. Composite targets are provided at the directorate level. Each division is required to submit a budget at the target case level first to the respective ADs. Additionally, a requirements case that exceeds the target level may also be submitted. Each AD looks at target and requirement cases within their directorate and works with the divisions to prioritize activities. ADs then prioritize those issues with the greatest risk and assure they are included within their existing targets. Institutional issues are prioritized and submitted for discussion by the SET, who will determine how best to fund them.

ES&H issues that arise throughout the year are dealt with quarterly. Requests are submitted through the respective ADs to BUS Division, which presents the data to the SET for review and prioritization. New funding is then allocated to divisions or the divisions are asked to re-prioritize existing funding to meet any substantial issues.

A work breakdown structure (WBS) that encompasses the primary ES&H elements was created and is used by FMs, regardless of funding source. A dictionary defines each of the elements within the WBS. The dictionary was a joint effort by the FMs, the program offices, and HSR, S, FWO, PM, and BUS Divisions. Use of the dictionary ensures consistency between the programs, the institution, and the elements required in the *ES&H Management Plan.* This helps the Laboratory to develop quality cost data, thus enhancing the Laboratory's ability to respond credibly to DOE cost data inquiries.

7.2. ES&H Deployed Personnel

The changing programmatic environment requires flexible customer-driven deployment of ES&H staffing to support activity- and facility-specific ES&H functions in the field. To meet this need, mechanisms for effective load leveling (including deployable worker pools, flexible funding, and contractor arrangements) have been established and are used by Laboratory management. Effective integration of ES&H into work requires all program and line managers to plan explicitly for ES&H in their annual budget cycle and for on-going resource management, including prioritization. ES&H resource planning and resource allocations by line management are based upon systematic needs analysis done jointly by the line and support organizations. Long-term planning of core institutional ES&H functions and staffing is also essential due to the broad mix of ES&H challenges at the Laboratory.

7.3. ES&H Management Plan

At the request of DOE, the Laboratory prepares and annually updates, in coordination with BUS and HSR Divisions, the *ES&H Management Plan*. The primary purpose of this plan is for DOE to outline strategies and performance measures for addressing high-level ES&H issues and potential impacts. Identification of potential ES&H issues will assist NNSA in doing forward-looking planning, as well as determining alternatives, trade-offs and recommendations. This five-year planning document identifies all funded and unfunded ES&H infrastructure support for the current year and out years. Data are available by functional area, as well.

This document also covers projected tasks, milestones, and costs associated with managing risks and achieving the institution's ES&H expectations, excluding the Environmental Management Program's activities (which are considered programmatic in nature). The document includes forecasts in both the G&A and direct budget categories for core institutional ES&H activities, planned compliance efforts, and unfunded compliance or improvement items.

The process for completing the plan is as follows:

(1) Divisions are asked for input into the plan, based on the ES&H Supplemental Budget Guidance to the Field Budget Handbook. This input includes identification and estimates of future ES&H needs (both funded and unfunded), identification of key ES&H improvements, and an estimate of current ES&H activities.

Note: Training and/or individual guidance is given to the divisions to help ensure consistency.

(2) Once input is received from the divisions, program managers, and the associated program analysts (e.g., the DP program analyst is consulted to ensure consistency with their budget processes (e.g., DP Site Plan).

(3) The HSR Division Leader uses the input to describe the high-risk ES&H activities that are currently funded, the high-risk ES&H activities that are currently unfunded or under funded, and other scenarios.

(4) The Laboratory submits the annual compliance liability statement that quantifies this information.

Appendix A: ISM Change Control Board

A.1. CCB Charter

The ISM Change Control Board operates under a charter that was created by DOE with concurrence of the Laboratory. The CCB meets quarterly to consider changes to the ISM description document and the implementation plan. The ISM CCB maintains a record of all actions taken at its meetings.

Los Alamos Area Office
Integrated Safety Management
Change Control Board Procedure

July 1997

Submitted: (original signed by D. Glenn, 7/28/97)
Dan Glenn, Senior Safety Advisor
Los Alamos Area Office

Reviewed: (original signed by G. Thomas Todd, 7/28/98)
G. Thomas Todd, Manager,
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Bruce G. Twining, Manager,
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Los Alamos Area Office
Integrated Safety Management
Change Control Board

1.0 PURPOSE

This procedure establishes requirements for the conduct of the Los Alamos National Laboratory (LANL) Integrated Safety Management (ISM) Change Control Board (CCB). The CCB is tasked with reviewing requests for changes to the LANL ISM Continuous Improvement Plan or System Description as accepted by the Manager, Albuquerque Operations Office (AL), Department of Energy (DOE).

2.0 SCOPE

This procedure applies to all personnel involved in submitting, reviewing, or approving requests for changes to the LANL ISM Continuous Improvement Plan, System Description Document, or Authorization Agreements.

3.0 RESPONSIBILITIES

3.1 Chair, CCB, is responsible for

a. reviewing submitted change request data,
b. assigning additional personnel to attend CCBs,
c. scheduling CCBs,
d. determining the board's recommendation to approve or disapprove requests for change,
e. presenting minority opinions to the approval authority, and
f. directing the conduct of the CCB.

3.2 Members, CCB are responsible for

a. reviewing submitted change request data,
b. attending CCBs as required, and
c. providing input to the CCB chair in making final recommendations to approve or disapprove requests for change, and
d. documenting any minority opinions.

3.3 LANL Program Manager for Integrated Safety Management (PRISM) is responsible for

a. submitting change request packages,

b. acting as the point of contact for the CCB in obtaining additional technical material when required, and
c. coordinating laboratory personnel attendance at CCB proceedings.

4.0 INSTRUCTION

4.1. Board Preparation

4.1.1. Two weeks prior to the convening date of the CCB, the PRISM will submit a Requests for Change Package to the CCB chair. The package will contain the following information.

LANL ISM Continuous Improvement Plan Milestone Schedule. The milestone schedule will include the current status of all milestones, and a discussion section for all late milestones.

A change request for each requested change. Change requests will be in the format included in this procedure as Attachment 1.

4.1.2. Upon receipt of the Requests for Change Package, the CCB chair will distribute copies of the package to all CCB members for review.

4.1.3. The CCB chair will review the package and determine if additional information is required or if additional technical personnel should be present at the board's proceedings to provide input to the board members.

4.1.3.1. If additional information is required from LANL, the CCB chair will notify the LANL PRISM of the requirements.
4.1.3.2. If additional DOE personnel are required to attend board proceedings, the chair will notify such individuals at least one week prior to the board convening date and will specify what technical information they are expected to provide.
4.1.3.3. If additional LANL personnel are required, the board chair will notify the LANL PRISM of the requirements at least one week prior to the board convening date and will specify the purpose for requesting their attendance at the board's proceedings.

4.2. Conduct of the Board

4.2.1. The board will consist of the following members:

Chairman, LAAO Senior Safety Advisor;
one member representing AL;
one member representing LANL; and
one member representing the University of California.

4.2.2. The board chair will assign an individual to record the minutes of the board meeting. Board meeting minutes will contain as a minimum

the date and time the board was convened,
the names of board members,
a list of attendees, and
the proposed changes discussed and the results.

4.2.3. The board will review each change request submitted by the Laboratory.

4.3.2.1. The Laboratory representative will discuss the change request for each identified item. The discussion will include why the change is necessary, and the impact of the change.

4.2.3.2. After any necessary discussion, the board will determine whether a recommendation to approve the change request will be forwarded. The board chair has the responsibility for the final decision for forwarding a recommendation for approval.

If the board determines that a change request is not substantiated by factors outside the control of the contractor, or by logical changes that are necessary to effect a more efficient, safety-focused approach, then the missed milestone will remain as overdue and will be identified as such for input into the annual Laboratory appraisal.

Any minority opinions from the board members or invited technical representatives will be communicated to LAAO by the board chair for final resolution.

4.3. At the conclusion of the board proceedings, the chair will indicate the board's recommendation for each request for change in the space provided on the Change Request Form (Attachment 1) and forward the forms, meeting minutes, and the Requests for Change Package to LAAO, for review.

4.4. Change Authorization

4.4.1. After review, LAAO, will sign those change requests that are approved in the space provided on the Change Request Form. A signature indicating approval of a change request is DOE authorization for the laboratory to make the described change to the implementation plan or system description document.

4.4.2. Completed Change Request Forms will be returned to the CCB chair for distribution.

5.0 RECORDS

The following records will be maintained for each board meeting:

5.1. Requests for Change Package, including copies of Change Request Forms signed by the CCB chair.

5.2. Board meeting minutes

6.0 ATTACHMENT 1: Change Request Form

Attachment 1

Change Request Form

IP Activity ID #	Activity Description

Description of Change Requested:

Justification for Change Request:

Submitted: _____ _____
LANL Change Control Coordinator **Date**

Recommendation: _____ _____
Approve/Disapprove (circle one) **CCB Chair** **Date**

Approved: _____ _____
Director, OLASO **Date**

A.2. CCB as WSS Convened Group

The work smart standards in Appendix G of the UC-DOE contract were selected in late 1997 using the DOE's necessary and sufficient process. This set of standards must be altered periodically in response to changes in DOE orders, consensus standards, and the work of the Laboratory. A process similar to that used to create the original list in Appendix G is used to change it. When a reason for a change is identified, a Laboratory-DOE focus group is formed to determine and recommend to the ISM CCB actions to be taken. The ISM CCB then acts as the convened group to accept, reject or recommend other actions. If the change is accepted by the CCB, it is taken forward to the UC and DOE contracting officers for incorporation into Appendix G.

The following memo gives the ISM CCB the role of the convened group.

A.3. Memo: Maintenance of the Current LANL ES&H Work Smart Standards

United States Government **Department of Energy**

memorandum

Albuquerque Operations Office
Los Alamos Area Office
Los Alamos, New Mexico 87544

DATE: **MARCH 30, 1998**
REPLY TO:
ATTN OF: LAAME:3JV-004
SUBJECT: Maintenance of the Current LANL ES&H Work Smart Standards (WSS)

TO: Robert Van Ness, Assistant Vice President for Laboratory Administration, UC
Larry Kirkman, Acting Assistant Manager, OTMO, AL
James Jackson, Deputy Director, DIR, LANL, MS-A100

The original Work Smart Standards effort successfully completed its original charter by modifying Appendix G of the DOE/UC contract in October 1997. A key element was the establishment of a convened group comprised of the contractual parties to steer the WSS effort. Maintenance of the current WSS set requires that a similar body of contractual parties steer the effort. To that end, the current ISM Change Control Board, comprised of the contractual parties, has consented to function as the convened group, and the membership is as follows:

Dan Glenn--DOE, Los Alamos Area Office (Chairman)
Steve Fattor--DOE, Albuquerque Operations Office
Lee McAtee--Los Alamos National Laboratory
Howard Hatayama--University of California, Office of the President

This memorandum documents that one of the roles of the ISM Change Control Board is to function as the Convened Group to steer the maintenance of the LANL ES&H WSS Standards.

Should you have any questions, please call Joe Vozella of my staff at (505) 665-5027.

(original signed by G.T. Todd)
G. Thomas Todd
Area Manager

Relevant Contract Clauses

Several clauses in the UC-DOE contract are important to the implementation of ISM: I.066 – DEAR 970.5204-2 LAWS, REGULATIONS, AND DOE DIRECTIVES (DEC 2000); I.074 – DEAR 970-5223-1 INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO WORK PLANNING AND EXECUTION (DEC 2000). Understanding of the requirements in these clauses is important to the understanding of ISM, and they are reproduced here for convenience.

Clause I.066. The Laws DEARS Clause

This clause is a modification of 48 CFR 970.5204-78. This clause is the basis for the selection of an inclusion of laws, regulations, and DOE directives in Appendix G. It is a requirement of this clause that "No DOE directive shall be considered a requirement of this contract unless it has been included in (Appendix G) in accordance with the procedures set out in this clause."

CLAUSE I.066 - DEAR 970.5204-2 LAWS, REGULATIONS, AND DOE DIRECTIVES (DEC 2000)

(Administrative Note**:** See Appendix G for Listing of Applicable Directives)

(a) In performing work under this Contract, the Contractor shall comply with the requirements of applicable Federal, State, and local laws and regulations (including DOE regulations), unless relief has been granted in writing by the appropriate regulatory agency. A List of Applicable Laws and regulations (List A) may be appended to this contract for information purposes. Omission of any applicable law or regulation from List A does not affect the obligation of the Contractor to comply with such law or regulation pursuant to this paragraph.

(b) In performing work under this Contract, the Contractor shall comply with the requirements of those DOE directives, or parts thereof, identified in the List of Applicable Directives (List B) appended to this Contract. Except as otherwise provided for in paragraph (d) of this clause, the Contracting Officer may, from time to time and at any time, revise List B by unilateral modification to the contract to add, modify, or delete specific requirements. Prior to revising List B, the Contracting Officer shall notify the Contractor in writing of the Department's intent to revise List B and provide the Contractor with the opportunity to assess the effect of the Contractor's compliance with the revised list on contract cost and funding, technical performance, and schedule; and identify any potential inconsistencies between the revised list and the other terms and conditions of the Contract. Within 30 days after receipt of the Contracting Officer's notice, the Contractor shall advise the Contracting Officer in writing of the potential impact of the contractor's compliance with the revised list. Based on the information provided by the Contractor and any other information available, the Contracting

Officer shall decide whether to revise List B and so advise the Contractor not later than 30 days prior to the effective date of the revision of List B. The Contractor and the Contracting Officer shall identify and, if appropriate, agree to any changes to other contract terms and conditions, including cost and schedule, associated with the revision of List B pursuant to the Section I clause entitled "Changes."

(c) Environmental, safety, and health (ES&H) requirements appropriate for work conducted under this contract may be determined by a DOE approved process to evaluate the work and the associated hazards and identify an appropriately tailored set of standards, practices, and controls, such as a tailoring process included in a DOE approved Safety Management System implemented under the clause entitled "Integration of Environment, Safety, and Health into Work Planning and Execution." When such a process is used, the set of tailored (ES&H) requirements, as approved by DOE pursuant to the process, shall be incorporated into List B as contract requirements with full force and effect. These requirements shall supersede, in whole or in part, the contractual environmental, safety, and health requirements previously made applicable to the contract by List B. If the tailored set of requirements identifies an alternative requirement varying from an ES&H requirement of an applicable law or regulation, the Contractor shall request an exemption or other appropriate regulatory relief specified in the regulation.

(d) Except as otherwise directed by the Contracting Officer, the Contractor shall procure all necessary permits or licenses required for the performance of work under this contract.

(e) Regardless of the performer of the work, the Contractor is responsible for compliance with the requirements of this clause. The Contractor is responsible for flowing down the requirements of this clause to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

Clause I.074. The ES&H DEARS Clause

This clause is taken from 48 CFR 970.5204-2, an is consistent with DOE Policy 450.4 "Safety Management System Policy." 48 CFR requires that this clause be in all DOE contracts, and subcontracts of DOE contractors, for organizations that are of sufficient size to have and ES&H organization. It is a legal requirement that DOE include the clause in the UC DOE contract, and a contractual requirement that we follow it. This clause applies to all UC managed laboratories and is the foundation of ISM.

CLAUSE I.074 - DEAR 970.5223-1 INTEGRATION OF ENVIRONMENT, SAFETY, AND HEALTH INTO WORK PLANNING AND EXECUTION (DEC 2000)

(a) For the purposes of this clause,

(1) Safety encompasses environment, safety and health, including pollution prevention and waste minimization; and

(2) Employees include subcontractor employees.

(b) In performing work under this contract, the Contractor shall perform work safely, in a manner that ensures adequate protection for employees, the public, and the environment, and shall be accountable for the safe performance of work. The Contractor shall exercise a degree of care commensurate with the work and the associated hazards. The Contractor shall ensure that management of environment, safety and health (ES&H) functions and activities becomes an integral but visible part of the contractor's work planning and execution processes. The Contractor shall, in the performance of work, ensure that:

(1) Line management is responsible for the protection of employees, the public, and the environment. Line management includes those Contractor and subcontractor employees managing or supervising employees performing work.

(2) Clear and unambiguous lines of authority and responsibility for ensuring (ES&H) are established and maintained at all organizational levels.

(3) Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

(4) Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.

(5) Before work is performed, the associated hazards are evaluated and an agreed-upon set of ES&H standards and requirements are established which, if properly implemented, provide adequate assurance that employees, the public, and the environment are protected from adverse consequences.

(6) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures.

(7) The conditions and requirements to be satisfied for operations to be initiated and conducted are established and agreed- upon by DOE and the contractor. These agreed-upon conditions and requirements are requirements of the contract and binding upon the contractor. The extent of documentation and level of authority for agreement shall be tailored to the

complexity and hazards associated with the work and shall be established in a Safety Management System.

(c) The Contractor shall manage and perform work in accordance with a documented Safety Management System (System) that fulfills all conditions in paragraph (b) of this clause at a minimum. Documentation of the System shall describe how the Contractor will:

(1) Define the scope of work;

(2) Identify and analyze hazards associated with the work;

(3) Develop and implement hazard controls;

(4) Perform work within controls; and

(5) Provide feedback on adequacy of controls and continue to improve safety management.

(d) The System shall describe how the Contractor will establish, document, and implement safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance while maintaining the integrity of the System. The System shall also describe how the Contractor will measure system effectiveness.

(e) The Contractor shall submit to the Contracting Officer documentation of its System for review and approval. Dates for submittal, discussions, and revisions to the System will be established by the Contracting Officer. Guidance on the preparation, content, review, and approval of the System will be provided by the Contracting Officer. On an annual basis, the Contractor shall review and update, for DOE approval, its safety performance objectives, performance measures, and commitments consistent with and in response to DOE's program and budget execution guidance and direction. Resources shall be identified and allocated to meet the safety objectives and performance commitments as well as maintain the integrity of the entire System. Accordingly, the System shall be integrated with the contractor's business processes for work planning, budgeting, authorization, execution, and change control.

(f) The Contractor shall comply with, and assist the DOE in complying with, ES&H requirements of all applicable laws and regulations, and applicable directives identified in the clause of this contract entitled "Laws, Regulations, and DOE Directives." The Contractor shall cooperate with Federal and non-Federal agencies having jurisdiction over ES&H matters under this contract.

(g) The Contractor shall promptly evaluate and resolve any noncompliance with applicable ES&H requirements and the System. If the Contractor fails to provide

resolution or if, at any time, the contractor's acts or failure to act causes substantial harm or an imminent danger to the environment or health and safety of employees or the public, the Contracting Officer may issue an order stopping work in whole or in part. Any stop work order issued by a Contracting Officer under this clause (or issued by the Contractor to a subcontractor in accordance with paragraph (i) of this clause) shall be without prejudice to any other legal or contractual rights of the Government. In the event that the Contracting Officer issues a stop work order, an order authorizing the resumption of the work may be issued at the discretion of the Contracting Officer. The Contractor shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage ordered in accordance with this clause.

(h) Regardless of the performer of the work, the Contractor is responsible for compliance with the ES&H requirements applicable to this Contract. The Contractor is responsible for flowing down the ES&H requirements applicable to this contract to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements.

(i) The Contractor shall include a clause substantially the same as this clause in subcontracts involving complex or hazardous work on site at a DOE-owned or -leased facility. Such subcontracts shall provide for the right to stop work under the conditions described in paragraph (g) of this clause. Depending on the complexity and hazards associated with the work, the Contractor may choose not to require the subcontractor to submit a Safety Management System for the contractor's review and approval.

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ISM Continuous Improvement Plan

The ISM Continuous Improvement Plan (CIP) is a listing of specific activities that will be undertaken by the Los Alamos National Laboratory in support of the implementation and sustained execution of integrated safety management. These actions are tracked by an issues management system maintained by Group AA-1. AA-1 verifies the completion of actions and also maintains a file of objective evidence of completion. Changes to the implementation plan are managed by the ISM CCB. The planned actions and target dates will be developed after this document is approved.

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Crosswalk Between ISM System Description and the Laboratory Standards and Requirements System

Section	Referenced Document
1.0	LPR 300-00-00, Integrated Safety Management
1.3	LIR 307-01-01, Self Assessment
1.3	LIR 301-00-00, Managing Change Control of Laboratory Operations Standards and Requirements
1.3	LIR 301-00-01, Issuing and Managing Laboratory Operations Implementation Requirements and Guidance
1.4	LIR 201-00-04, LANL Incident Reporting Process
1.4	LIR 307-01-01, Self Assessment
1.4	LIR 307-01-04, Safety Concern Program
1.4	LIR 401-10-01, Stop Work and Restart
1.5	LIR 307-01-03, Management Safety Walk-around
1.7	LIR 301-00-00, Managing Change Control of Laboratory Operations Standards and Requirements
1.7	LIR 301-00-01, Issuing and Managing Laboratory Operations Implementation Requirements and Guidance
1.7	LIR 301-01-04, Safety Concern Program
2.0	LPR 300-00-00, Integrated Safety Management
2.1	LPR 300-00-00, Integrated Safety Management
2.2	LPR 300-00-00, Integrated Safety Management
2.2.1	LPR 300-00-00, Integrated Safety Management
2.2.2	LPR 300-00-00, Integrated Safety Management
2.3	LPR 300-00-00, Integrated Safety Management
2.4	LIR 230-01-02, Graded Approach for Facility Work
2.4	LIR 402-10-01, Hazard Analysis and Control for Facility Work
2.4	LIR 300-00-01, Safe Work Practices
2.4	LIR 230-03-01, Facility Management Work Control
2.4	LIR 402-10-01, Hazard Analysis and Control for Facility Work
2.4	LIR 250-02-02, Facility Tenant-Agreements
2.4	LPR 240-01-0, Define Facility and Tenant Operations Limits and Configuration
2.4	LIG 240-01-10, Facility Safety Plan
2.5	LPR 300-00-00, Integrated Safety Management
3.1	LIR 201-00-04, LANL Incident Reporting Process
3.1	LIR 401-10-01, Stop Work and Restart
3.1	LIR 300-00-01, Safe Work Practices
3.1	LIR 230-03-01, Facility Management Work Control
3.2	LIR 300-00-01, Safe Work Practices
3.2	LIR 230-03-01, Facility Management Work Control
3.2	LIR 307-01-03, Management Safety Walk-arounds
3.8.3	LIR 307-01-03, Management Safety Walk-arounds
3.8.3	LIG 240-01-10, Facility Safety Plan

Section	Referenced Document
3.8.3	LIR 300-00-05, Facility Hazard Categorization
3.8.3	LIR 300-00-06, Nuclear Facility Safety Authorization
3.8.3	LIR 300-00-07, Non-Nuclear Facility Safety Authorization
3.8.3	LIR 240-01-03, Authorization Agreements
3.8.3	LIR 250-02-02, Facility-Tenant Agreements
3.9	LIR 401-10-01, Stop Work and Restart
3.9	LIR 307-01-04, Safety Concern Program
3.9	LIR 300-00-00, Safe Work Practices
3.9	LIR 230-03-01, Facility Management Work Control
3.9	LIR 201-00-04, LANL Incident Reporting Process
4.0	LPR 300-00-00, Integrated Safety Management
4.1	LIR 301-00-00, Managing Change Control of Laboratory Operations Standards and Requirements
4.1	LIR 301-00-01, Issuing and Managing Laboratory Operations Implementation Requirements and Guidance
4.1.1	LIR 301-00-00, Managing Change Control of Laboratory Operations Standards and Requirements
4.1.2	LIR 301-00-00, Managing Change Control of Laboratory Operations Standards and Requirements
4.1.3	LIR 301-00-01, Issuing and Managing Laboratory Operations Implementation Requirements and Guidance
4.1.3	LIG 302-100-03, Guide for Developing Laboratory Operations Implementation Requirements and Guidance
4.1.3	LIR 301-00-02, Variance and Exceptions to Laboratory Operations Requirements
4.1.4	LIR 301-00-00, Managing Change Control of Laboratory Operations Standards and Requirements
4.1.4	LIR 301-00-01, Issuing and Managing Laboratory Operations Implementation Requirements and Guidance
4.1.4	LIG 302-100-03, Guide for Developing Laboratory Operations Implementation Requirements and Guidance
4.1.4	LIR 301-00-02, Variance and Exceptions to Laboratory Operations Requirements
4.1.5	LIR 301-00-02, Variance and Exceptions to Laboratory Operations Requirements
4.1.6	LIR 301-00-02, Variance and Exceptions to Laboratory Operations Requirements
4.1.6	LIR 300-00-01, Safe Work Practices
4.1.7	LPR 308-00-00, Quality
4.1.7	LPR 310-00-00, Conduct of Operations
4.2.1	LIR 301-00-00, Managing Change Control of Laboratory Operations Standards and Requirements
4.2.2	LIR 300-00-01, Safe Work Practices

Section	Referenced Document
4.2.2	LIR 300-00-02, Documentation of Safe Work Practices
4.2.2	LIR 230-03-01, Facility Management Work Control
4.2.2.1	LIR 300-00-01, Safe Work Practices
4.2.2.3	LIR 230-03-01, Facility Management Work Control
4.2.2.3	LIR 230-03-02, Maintenance Skill of Craft
4.2.2.3	LIR 402-10-01, Hazard Analysis and Control for Facility Work
4.2.3.2	LIR 250-02-02, Facility-Tenant Agreements
4.2.3.2	LIG 250-02-02, Facility-Tenant Agreements
4.2.3.3	LPR 240-10-01, Facility and Operating Limits and Configuration
4.2.3.3	LIG 240-01-10, Facility Safety Plan
5.0	LIR 300-00-04, Laboratory Training
5.1	LIR 300-00-05, Facility Hazard Categorization
5.1	LIR 300-00-06, Nuclear Facility Safety Authorization
5.1	LIR 300-00-07, Non-Nuclear Facility Safety Authorization
5.3	LIR 280-01-01, Facility Management Training and Qualification Program
5.4	LIR 300-00-04, Laboratory Training
5.5	LIR 300-00-04, Laboratory Training
6.2	LIR 307-01-01, Self Assessment
6.2	LIR 307-01-03, Management Safety Walk-arounds
6.2.1	LIR 307-01-01, Self Assessment
6.2.1.2	LIR 307-01-01, Self Assessment
6.2.2	LIR 300-00-01, Safe Work Practices
6.2.3	LIR 307-01-01, Self Assessment
6.2.4	LIR 307-01-01, Self Assessment
6.3.1	LIR 402-130-01, Abnormal Events
6.3.2	LIR 307-01-04, Safety Concern Program